G 7113 (Pages : 3) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, APRIL 2011

Fifth Semester

Branch—Civil/Mechanical/Electrical/Electronics/Electronics and Communication/ Polymers/Applied Electronics and Instrumentation/Electronics and Instrumentation/ Automobile Engineering

ENGINEERING MATHEMATICS—IV (CMELPASU)

(Supplementary)

Time : Three Hours Maximum : 100 Marks

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

Module I

1. (a) Evaluate $\int_C \left\{(z+1)/\left(z^2+2z+4\right)\right\} dz$ where C is the circle $|z+1+i|=2$.

   (b) Expand $f(z)=1/(z+1)(z+2)$ as a Taylor's series about the point $z=2$.

Or

2. (a) Find the Laurent's series for $f(z)=1/(z-1)(z-2)$ in the regions :

   (i) $1<|z|<2$,

   (ii) $|z|>2$ and

   (iii) $0<|z-1|<1$.

   (b) Evaluate $\int_0^{\pi} \frac{\cos 2\theta}{5+4\cos\theta} d\theta$.

Module II

3. (a) Find the root of $xe^x-2=0$ correct to four places of decimals using Regula Falsi method.

   (b) Using Jacobi's method solve correct to four decimal places :

   $10x+y+z=12,\ 2x+10y+z=13,\ 2x+2y+10z=14$.

Or

Turn over

4. (a) Find the value of $\sqrt{10}$ correct to four decimal places using Newton-Raphson method.

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

$2x - y + 11z = 20, 10x - 2y + z = 12, x + 9y - z = 10.$

Module III

5. (a) Using Euler's modified method compute the value of y when $x = 0.1$ given that :

$y^1 = x^2 + y, y(0) = 1, h = 0.05.$

(b) Using Milnes predictor corrector method find $y(0.4)$ and $y(0.5)$ given $\frac{dy}{dx} = 1 + xy^2 + \; y(0) = 1,$

$y(0.1) = 1.105$, $y(0.2) = 1.223$ and $y(0.3) = 1.355$.

Or

6. (a) Compute $y(0.5)$ and $y(1)$ using Taylor series method where $\frac{dy}{dx} = x^2 + y^2, y(0) = 1.$

(b) Given $\frac{dy}{dx} = x + 2y$ where $y = 1$ when $x = 0$ using Runge-Kutta method compute $y(0.2)$ and $y(0.4)$ correct to four decimal places.

Module IV

7. (a) Find the z transforms of the following :–

(i) $\cosh n\theta$;

(ii) $\cos\left\{\frac{n\pi}{2} + \frac{\pi}{4}\right\}$;

(iii) $(n + 1)$.

(b) Use convolution theorem to evaluate $z^{-1}\left\{z^2/(z-1)(z-3)\right\}$.

Or

8. (a). Evaluate $z^{-1}\left\{\left(3z^2 + 2\right)/(5z - 1)(5z + 2)\right\}$.

(b) Using Z transforms solve $y_{n+2} + 4y_{n+1} + 3y_n = 2^n$ with $y_0 = 0$ and $y_1 = 1$.

Module V

9. (a) Using Simplex method solve :

Maximize $Z = 6x_1 + 4x_2$

subject to $-2x_1 + x_2 \leq 2$

$x_1 - x_2 \leq 2$

$3x_1 + 2x_2 \leq 9$

$x_1, x_2 \geq 0$

(b) Using Big M method solve :

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

$3x_1 + x_2 \geq 27$

$x_1 + x_2 \geq 21$

$x_1 + 2x_2 \geq 30$

$x_1, x_2 \geq 0$

Or

10. (a) Use two phase method to solve :

Maximize $Z = 3x_1 - x_2$ such that

$2x_1 + x_2 \geq 2$

$x_1 + 3x_2 \leq 2$

$x_2 \leq 4$

$x_1, x_2 \geq 0$

(b) Solve the following transportation problem :—

	D_1	D_2	D_3	D_4	D_5	*Supply*
O_1	3	4	6	8	9	20
O_2	2	10	1	5	8	30
O_3	7	11	20	40	3	15
O_4	2	1	9	14	16	13
Demand	40	6	8	18	6	78

(5 × 20 = 100 marks)

G 7119 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, APRIL 2011

Fifth Semester

Branch : Electronics and Communication Engineering/Applied Electronics and Instrumentation Engineering

POWER ELECTRONICS (L A)

(Supplementary)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

Each question carries 4 *marks.*

1. Draw the V-I characteristics of SCR for two different gate currents. Show the holding and latching currents.
2. Compare power MOSFET and IGBT.
3. What is the need for series and parallel operation of SCRS?
4. What are the advantages of using a free-wheeling diode in the converted circuit?
5. What is the effect of source inductance on the output voltage of the converter?
6. Explain the two methods of voltage control employed in a.c. voltage controllers.
7. Discuss briefly the various control strategies employed in chopper circuits.
8. With neat circuit diagram, explain the principle of a step up chopper.
9. What is a current source Inverter?
10. Discuss any *two* methods of improvement of waveforms in the case of a voltage source inverter.

(10 × 4 = 40 marks)

Part B

Each question carries 12 *marks.*

11. Discuss the characteristics, rating and specification of various power semiconductor devices SCRs, GTO, BJT, MCT, MOSFET and IGBT.

Or

12. (a) Discuss briefly on the protection of power semiconductor devices.

    (b) Discuss the static and dynamic equalizing circuits for series connected SCRs.

Turn over

13. With necessary circuit diagram and waveforms, explain the operation of a single phase full wave bridge rectifier with RLE load. Obtain the output voltage.

Or

14. (a) Explain with block schematic the PWM chip SG 3524.

(b) What are the power factor improvement methods for phase controlled rectifiers?

15. An a.c. voltage controller operating from 230 V, 50 Hz supply uses integral cycle control to control the flow of power to 10 Ω load. The thyristors conduct for 18 cycles and remain off for 32 cycles. Find (a) r.m.s. output voltage ; (b) Power output ; (c) Input power factor ; (d) Average SCR current.

Or

16. (a) Explain briefly the configuration three-phase controllers.

(b) Draw the waveforms of a single phase voltage controller with RL load.

17. Give the complete time domain analysis of a type A chopper feeding RLE load. Draw the necessary waveforms and derive relevant expressions.

Or

18. (a) Explain the operation of a two Quadrant d.c. chopper with a neat diagram.

(b) Discuss the application of choppers.

19. Draw the power circuitry of a single-phase bridge inverted and explain its operation with relevant waveforms.

Or

20. (a) List the commonly used PWM techniques for voltage control of inverters.

(b) What are the various harmonies reduction techniques?

(5 × 12 = 60 marks)

G 7128 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION APRIL 2011

Fifth Semester

Branch : Electronics and Communication Engineering

APPLIED ELECTROMAGNETIC THEORY (L)

(Supplementary)

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions.*

Each question carries 4 *marks.*

1. Explain Scalar field and Vector field.
2. State and explain divergence theorem.
3. Explain Self and Mutual inductance.
4. State and explain Ampere's Circuital law.
5. Obtain differential form of Ohm's Law.
6. Define Poynting Vector and explain its significance.
7. Show that TEM mode is absent in a wave guide.
8. Compare propagation of EM waves through wave guides and that through unbounded medium.
9. What are the applications of Smith Chart ?
10. Compare open stub matching and short stub matching.

(10 × 4 = 40 marks)

Part B

Each question carries 12 *marks.*

11. Explain the transformation of a vector from rectangular co-ordinate system to spherical and Vice Versa.

Or

12. Define Capacitance from fundamentals derive the expression for capacitance of a two wire transmission line.
13. Explain BIOT Savart's Law. Obtain the expression for flux density due to an infinitely long straight conductor carrying current.

Or

Turn over

14. Obtain the expression for inductance of a long solenoid. What is vector magnetic potential ?

15. Obtain the equations for electromagnetic waves in a conducting medium. What is skin depth ?

Or

16. What is Continuity Equation ? State and explain Poynting theorem.

17. Explain the propagation of waves through rectangular waveguides.

Or

18. What is wave impedance and surface impedance ? Describe the various methods of exciting wave guides.

19. Explain with necessary theory, the construction of Smith Chart.

Or

20. Explain phase velocity and group velocity. What is skin effect ?

(5 × 12 = 60 marks)

G 7137 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, APRIL 2011

Fifth Semester

Branch : Electronics and Communication/Applied Electronics and Instrumentation Engineering

COMPUTER ORGANIZATION AND ARCHITECTURE (L A)

(Supplementary)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

Each question carries 4 *marks.*

1. Why do we need different types of addressing modes?
2. How is a fixed point different from a floating point number system?
3. What is the significance of an instruction execution cycle?
4. Explain the significance of PLAs.
5. Give the advantages of MOS devices.
6. List out the standards that you are familiar with disk drives.
7. What is the need for handling multiple devices by a computer?
8. What is the need for bus scheduling?
9. What is parallel processing?
10. What is the need for the interconnection of networks of processors?

(10 × 4 = 40 marks)

Part B

Each question carries 12 *marks.*

11. Classify the different instructions under various categories and give examples.

Or

12. Illustrate Booth's algorithm with an example.

13. Describe the design of a hard wired control unit using PLAs.

Or

14. Describe the design of a micro programmed control unit.

Turn over

15. Write a note on interleaving of memories.

Or

16. Describe the different types of replacement algorithms that you are familiar with.

17. Explain in detail, how a processor identifies the source of interrupt by various techniques.

Or

18. What is bus arbitration? How is it resolved in a processor?

19. What is the significance of a pipeline processor? Explain.

Or

20. Explain in detail about the array processors.

(5 × 12 = 60 marks)

G 7147 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, APRIL 2011

Fifth Semester

Branch : Applied Electronics and Instrumentation/Electronics and Instrumentation
Electronics and Communication

LINEAR INTEGRATED CIRCUITS (L A S)

(Supplementary)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

Each question carries 4 *marks.*

1. Define Slew rate. What are its effects on the performance of Op-amp ?
2. Explain why compensation is required for Op amps.
3. Compare the characteristics of Voltage Series and Voltage Shunt feedback configurations.
4. Explain the concept of Virtual ground.
5. Draw and explain an Op amp Comparator circuit.
6. Draw and explain a peak detector circuit. What are its applications ?
7. Explain the basic principle of Switched Capacitor filter.
8. Explain the astable multivibrator using 555 timer.
9. Compare the characteristics of 78XX– and 79XX – series voltage regulators.
10. What are the applications of 8038 chip ?

(10 × 4 = 40 marks)

Part B

Each question carries 12 *marks.*

11. (a) Draw and explain the functional block diagram of an OP amp.

Or

(b) Explain the frequency response of an Op amp. Explain the compensation techniques used in Op amp.

12. (a) Draw and explain the circuits of V/I converts. Discuss their applications also.

Or

(b) Explain the use of offset minimizing resistor. Discuss the steps involved in its design.

Turn over

13. (a) Draw and explain the circuit of a log amplifier. Derive the output equation. What are its applications?

Or

(b) Draw and explain the circuit of a Wien bridge Oscillator using Op amp. Derive an expression for its frequency of Oscillation.

14. (a) Draw and explain the circuit of a second order BPF. Derive its transfer function.

Or

(b) Draw and explain the circuit of a monostable multivibrator using 555 timer. What are its characteristics?

15. (a) Draw the functional block diagram of an IC voltage regulator. Explain the functions of each block.

Or

(b) Discuss the communication applications of PLL.

(5 × 12 = 60 marks)

G 7154 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, APRIL 2011

Fifth Semester

Branch : Electronics and Communication/Electronics and Instrumentation Engineering

MICROPROCESSORS AND MICROCONTROLLERS (LS)

(Supplementary)

Time : Three Hours Maximum : 100 Marks

Part A

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

1. Explain the concept of tristate buffer.
2. What is the use of ALE signal in 8085.
3. Explain idle mode in 89C51.
4. Explain the purpose of XTAL1 and XTAL2 pins in 89C51.
5. What is the purpose of DPL and DPH registers ?
6. Distinguish between Bit jumps and Byte jumps.
7. Discuss the effects of PUSH and POP instructions.
8. How is single step operation achieved ?
9. Define baud rate.
10. Explain the power on reset circuit.

(10 × 4 = 40 marks)

Part B

Each question carries 12 *marks.*

11. (i) Distinguish between Memory mapped I/o and I/o mapped I/o schemes. (6 marks)

    (ii) Explain the instruction fetch and execution cycles of 8085. (6 marks)

Or

12. With a diagram show 8085 can be interfaced with EPROM chip. (12 marks)
13. Draw a software model for 89C51 and explain. (12 marks)

Or

14. With proper diagrams, explain the port pin circuits of 89C51. (12 marks)

Turn over

15. (i) Write a program to check how many times the byte OEH is occurring in 9 bytes of data stored in RAM location 60 H onwards. Store the result in location 70 H.

(7 marks)

(ii) Explain with example, the various bit level Boolean operations available in 89C51. (5 marks)

Or

16. (i) With examples, explain direct and indirect addressing modes in 89C51. (6 marks)

(ii) An array of 9 bytes is stored in memory location 60 H onwards. Write a program to reverse the array and store the result in same locations.

(6 marks)

17. Explain the sequence of events occurring during a hardware interrupt. Illustrate with an example program.

(12 marks)

Or

18. Explain how interrupt priority is determined in 89C51 ? What happens when two interrupts with same priority occurs ? Illustrate with example.

(12 marks)

19. Explain the different timer modes in 89C51. (12 marks)

Or

20. Write short notes on :

(i) On-chip oscillator in 89C51. (4 marks)

(ii) ONCE method. (4 marks)

(iii) USART. (4 marks)

[5 × 12 = 60 marks]