D 10606 (Pages : 2) Name.....

Reg. No.....

FIFTH SEMESTER U.G. DEGREE EXAMINATION, NOVEMBER 2021

(CBCSS-UG)

Electronics

ELE 5D 03—ELECTRONICS FUNDAMENTALS

(2019 Admissions)

Time : Two Hours Maximum : 60 Marks

Section A

Answer at least **eight** *questions.*
Each question carries 3 *marks.*
All questions can be attended.
Overall Ceiling 24.

1. What is emf ? Write its unit.
2. Define electrical resistance. Write its symbol and unit.
3. State the relation between Kcal and KWh.
4. Explain the difference between primary and secondary batteries.
5. What do you meant by voltage division rule ?
6. Draw a series circuit with three resistors and a battery.
7. What do you meant by series-parallel circuit ?
8. If a parallel circuit is open in the main line, the current is ———— in all the branches.
9. What are the different waveforms used in the field of electronics ?
10. Explain what do you understand the terms phase and phase difference.
11. What are the properties of ideal transformer ?
12. A reactive element in an AC circuit causes the current flowing :

    (i) To lead in phase by $\frac{\pi}{2}$.

    (ii) To lag in phase by $\frac{\pi}{2}$.

    Identify the elements in each case.

(8 × 3 = 24 marks)

Turn over

Section B

Answer at least **five** *questions.*
Each question carries 5 *marks.*
All questions can be attended.
Overall Ceiling 25.

13. Compare D.C. voltage and A.C. voltage.

14. Explain the function of a battery charger and mentions its important elements.

15. Write a short note on variable capacitors.

16. State and explain Kirchoff's Laws.

17. Explain the following terms, (i) 'Open' in a series circuit ; and (ii) 'Shorts' in a series circuit.

18. A heating element is marked 210 V, 630 W. Find the resistance of the element when connected to a 210 V dc source.

19. What is a transformer? How does it work ?

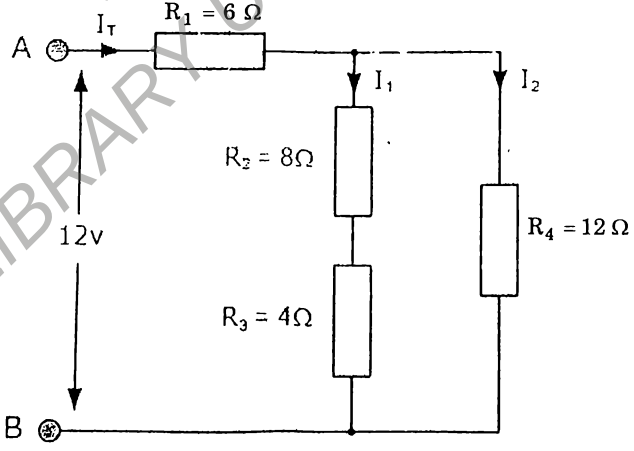
(5 × 5 = 25 marks)

Section C

Answer any **one** *question.*
The question carries 11 *marks.*

20. Explain briefly about different types of batteries and specify applications of each.

21. Calculate the current I_T taken from a 12 V supply.



(1 × 11 = 11 marks)

D 10605 (Pages : 2) Name.....

Reg. No.....

FIFTH SEMESTER U.G. DEGREE EXAMINATION, NOVEMBER 2021

(CBCSS—UG)

Electronics

ELE 5D 02—DIGITAL FUNDAMENTALS

(2019 Admissions)

Time : Two Hours Maximum : 60 Marks

Section A

Answer at least **eight** *questions.*
Each question carries 3 *marks.*
All questions can be attended.
Overall Ceiling 24.

1. Convert $(10111)_2$ to decimal.
2. Convert $(57)_{10}$ to hexadecimal.
3. Given $X = 1010101_2$ and $Y = 1001011_2$, perform the subtraction X-Y using 2's complement method.
4. Draw the symbol and truth table of AND gate.
5. Simplify using De Morgan's theorem : $(A + (BC)')'$.
6. Simplify the expression $A + ABC + A'BC$.
7. Draw the truth table of half subtractor.
8. Draw the truth table of SR FF.
9. How will you convert a JK FF into D FF ?
10. What are the disadvantages of asynchronous counters ?
11. Specify two applications of shift registers.
12. How will you convert a shift register into ring counter ?

($8 \times 3 = 24$ marks)

Section B

Answer at least **five** *questions.*
Each question carries 5 *marks.*
All questions can be attended.
Overall Ceiling 25.

13. Simplify the function, $f(A, B, C) = A'B + BC' + BC + AB'C'$.
14. Explain the universal property of NOR gate.

Turn over

15. What is a half adder ? Draw its truth table and obtain the simplified expression for sum and carry. Implement half adder using logic gates.

16. Using K map, minimize the expression $f(A, B, C, D) = A'B'C'D' + A'B'C'D + A'B'C D + A'B'C D' + B C'D' + B C D' + AB'C'D' + A B'D + A B'C D'$.

17. Explain the working of JK FF with diagram.

18. Explain the working of a serial-in-serial-out shift register with diagram.

19. Draw the circuit of a 3 bit asynchronous counter. Also draw its timing diagram.

(5 × 5 = 25 marks)

Section C

Answer any **one** *question.*
The question carries 11 *marks.*

20. Simplify the expression $f(A, B, C, D) = \sum m(1, 3, 4, 6, 8, 9, 11, 13, 15) + \sum d(0, 2, 14)$.

21. With diagrams, explain the working of a synchronous decade counter.

(1 × 11 = 11 marks)

D 10604 (Pages : 2) Name.....

Reg. No.....

FIFTH SEMESTER U.G. DEGREE EXAMINATION, NOVEMBER 2021

(CBCSS—UG)

Electronics

ELE 5D 01—COMPUTER HARDWARE

(2019 Admissions)

Time : Two Hours Maximum : 60 Marks

Section A

Answer at least **eight** *questions.*
Each question carries 3 *marks.*
All questions can be attended.
Overall Ceiling 24.

1. Distinguish between Microcomputer and Mainframe computer.
2. What is the function of the memory subsystem in a computer ?
3. What is a program development tool ?
4. What is a bus ? What are the major types of buses ?
5. List the hexadecimal numbers in sequence from 380 to 3A0.
6. Find the 2's complement of binary number $(101101)_2$.
7. Write a note on ASCII code.
8. What do you understand by the term logic family ?
9. What is a touch screen ?
10. Differentiate between hardware and software.
11. What is an output device ? Name two output devices.
12. What is multicore technology and how does it relate to multiprocessing ?

(8 × 3 = 24 marks)

Section B

Answer at least **five** *questions.*
Each question carries 5 *marks.*
All questions can be attended.
Overall Ceiling 25.

13. What are the features of fourth generation computers ?
14. What is ALU ? Explain its function.

Turn over

15. What is the difference between a compiler and an editor ? What facilities are provided by an editor ?

16. Perform the following operation : $(1111)_2 + (1010)_2 - (1100)_2$.

17. Draw the symbol of two input AND gate and explain its operation using truth table.

18. Distinguish between impact and non-impact printers. Categorize dot matrix printer, daisy wheel printer, thermal printer and inkjet printer as impact or non-impact printer.

19. Explain the working of CRT.

(5 × 5 = 25 marks)

Section C

Answer any **one** *question.*
The question carries 11 *marks.*

20. Draw block diagram of basic components of a computer system. Explain each component in detail.

21. Describe briefly any three input devices.

(1 × 11 = 11 marks)

FIFTH SEMESTER U.G. DEGREE EXAMINATION, NOVEMBER 2021

(CBCSS—UG)

Electronics

ELE 5B 12—NETWORK THEORY

(2019 Admissions)

Time : Two Hours and a Half Maximum : 80 Marks

Section A

Answer at least **ten** *questions.*
Each question carries 3 *marks.*
All questions can be attended.
Overall Ceiling 30.

1. Differentiate between ideal voltage source and practical voltage source.
2. Define Independent source.
3. A 100 Ω resistor is connected to a 220 V, 50 Hz a.c. supply.

   What is the r.m.s. value of current in the circuit ?
4. What is a linear network ? Give linear network elements.
5. Define steady state response.
6. Obtain the equivalent resistance of two resistors connected in parallel.
7. Define Time constant of a RL circuit.
8. Define Magnetic coupling.
9. What is transient response of RL series circuit ?
10. Define Power Factor.
11. Differentiate between peak value and peak to peak value of alternating current.
12. What is the complex impedance of a series of RC circuit ?
13. Differentiate between reactive power and average power.

14. Explain the significance of quality factor.

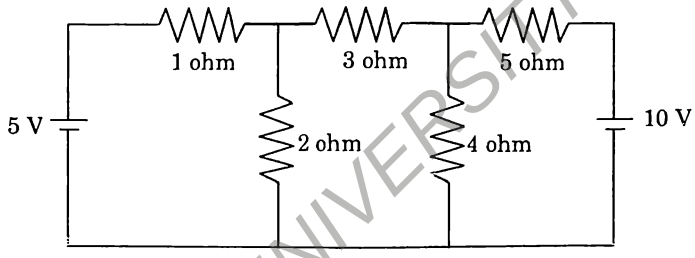
15. Define Resonance. What is the condition for resonance for an RLC series circuit ?

(10 × 3 = 30 marks)

Section B

Answer at least **five** *questions.*
Each question carries 6 *marks.*
All questions can be attended.
Overall Ceiling 30.

16. Find the value of the currents 11, 12 and 13 flowing clockwise in the first, second and third mesh respectively.



17. What is Capacitance ? Derive the expression for total capacitance : (i) a number of capacitors connected in series ; (ii) number of capacitors connected in parallel.

18. Explain the star network with phasor diagram.

19. Sketch the DC response of RC circuit and response curve.

20. Calculate the current through a 250 mH inductor after charging through a series-connected resistor with 100 Ω of resistance for 6 milliseconds, powered by a 12 volt battery.

21. A d.c. voltage of 100 V is suddenly applied to a circuit consisting of 100 capacitor connected in series. The capacitor is initially uncharged. Find the voltage across the capacitor at the time of switching on the d.c. source.

22. Derive the expression of quality factor of parallel RLC circuit.

23. What is resonance ? Derive the expression for resonant frequency of series RLC circuit.

(5 × 6 = 30 marks)

Section C

Answer any **two** *questions.*
Each question carries 10 *marks.*

24. (a) Explain different types of Sources. Differentiate between ideal and practical sources.

    (b) Explain mesh and node analysis with the help of examples.

25. (a) Explain the current voltage relation in R-L series circuit.

    (b) Explain the current voltage relation in E-C series circuit.

26. Explain the construction of a practical parallel resonant circuit. Derive the expression for the resonant frequency of a parallel resonant circuit.

    An alternating voltage is given by V = 230 sin 314t. Calculate : (i) Frequency ; (ii) Maximum value ; (iii) Average value ; and (iv) RMS value.

27. (a) Explain about Star and Delta connected three-phase balanced circuits.

    (b) Derive the equations to convert : (i) Delta network to Star network ; and (ii) Star network to a Delta network.

(2 × 10 = 20 marks)

D 10602 (Pages : 2) Name.....

Reg. No.....

FIFTH SEMESTER U.G. DEGREE EXAMINATION, NOVEMBER 2021

(CBCSS—UG)

Electronics

ELE 5B 11—MICROCONTROLLER AND INTERFACING

(2019 Admissions)

Time : Two Hours Maximum : 60 Marks

Section A

Answer at least **eight** *questions.*
Each question carries 3 *marks.*
All questions can be attended.
Overall Ceiling 24.

1. Draw the Oscillator circuit of 8051.
2. What is SFRs ?
3. Explain TMOD and PCON registers.
4. What is timer flag interrupt ?
5. Discuss Arduino interrupts.
6. Explain the auto - reload mode of timers in 8051.
7. What is addressing mode ? Explain register addressing mode in 8051.
8. What are the advantages of Arduino ?
9. What is Stack ? Explain the function of Stack Pointer.
10. Explain the function of data pointer in 8051.
11. Explain analogWrite() function in Arduino programming.
12. Distinguish LJMP and SJMP instructions of 8051.

(8 × 3 = 24 marks)

Section B

Answer at least **five** *questions.*
Each question carries 5 *marks.*
All questions can be attended.
Overall Ceiling 25.

13. Write an 8051 Assembly Language Program to find the largest among 20 numbers stored at external memory location.

14. Explain the functions of Port 0 and Port 2 of 8051

15. Explain the RAM organization of 8051.

16. Explain the procedure for delay calculation in 8051.

17. Explain the interfacing of a serial monitor with Arduino.

18. With XTAL = 11.0592 MHz, find the TH1 value needed to have the following baud rates in an 8051 UART when SMOD=0. (a) 9600 (b) 2400

19. Explain the procedure for handling interrupts in 8051.

(5 × 5 = 25 marks)

Section C

Answer any **one** *question.*
The question carries 11 *marks.*

20. Explain the instruction set of 8051 with suitable examples.

21. Explain the architecture of 8051 with the help of a neat figure.

(1 × 11 = 11 marks)

D 10601 (Pages : 3) Name.....

Reg. No.....

FIFTH SEMESTER U.G. DEGREE EXAMINATION, NOVEMBER 2021

(CBCSS—UG)

Electronics

ELE 5B 10—ELECTROMAGNETIC THEORY

(2019 Admissions)

Time : Two Hours and a Half Maximum : 80 Marks

Section A

Answer at least **ten** *questions.*
Each question carries 3 *marks.*
All questions can be attended.
Overall Ceiling 30.

1. Write equations to convert a point in Cartesian Co-ordinate System to a point in Cylindrical Co-ordinate System.
2. Write expression for the gradient of a scalar field in Cartesian Co-ordinate System.
3. State Divergence theorem.
4. What is meant by method of images ?
5. State Coulomb's Law.
6. Briefly explain the potential at a point and write an expression for the potential at a point P which is at a distance R from a charge Q.
7. What is magnetic dipole ?
8. What is Gauss's law in magnetostatics ?
9. State Kirchhoff's voltage law.
10. What is meant by TEM wave ?
11. What is conduction current ?
12. What is a uniform plane wave ?

13. Express a vector $\vec{A}$ in Cartesian co-ordinate system and Cylindrical co-ordinate system.

14. Write equations for electrostatic energy density and magnetostatic energy density.

15. Define Magnetic field intensity $\vec{H}$.

(10 × 3 = 30 marks)

Section B

Answer at least **five** *questions.*
Each question carries 6 *marks.*
All questions can be attended.
Overall Ceiling 30.

16. Explain the physical interpretation of divergence with examples.

17. Convert (7, 4, 3) from rectangular co-ordinates to spherical co-ordinates.

18. Derive Poisson's equation and Laplace's equation from Gauss's law.

19. If a charge of 2μ C is located at P_1 (1, 0, 0) is placed in free space. Find the electric field strength at P_2 (0, 1, 0).

20. Derive the equation of continuity for time varying field.

21. State and prove the magnetostatic boundary condition that $\vec{H}$ must obey at the interface between two dielectric media.

22. Briefly explain the polarization of a uniform plane wave.

23. The amplitude of the magnetic field in a plane wave is 2 A/m. (a) determine the magnitude of the electric field for the plane wave in free space ; (b) Find the intrinsic impedance of the medium characterized by $\sigma = 0, \mu = \mu_0$ and $\varepsilon = 4\varepsilon_0$.

(5 × 6 = 30 marks)

Section C

Answer any **two** *questions.*
Each question carries 10 *marks.*

24. Briefly explain Poynting's theorem. Derive an expression for the Poynting vector.

25. Derive Faraday's law and Ampere's law for time varying field.

26. Write expressions for divergence of a vector quantity in spherical co-ordinate system. Explain the physical significance of gradient and curl with examples.

27. A point charge $Q_1 = 3 \times 10^{-4}$ C is at (1, 2, 3) and a second charge, $Q_2 = -10^{-4}$C is at (2, 0, 5). Find the force on Q_2 due to Q_1 if they are in free space.

(2 × 10 = 20 marks)

D 10158 (Pages : 3) Name.....

Reg. No.....

FIFTH SEMESTER U.G. DEGREE EXAMINATION, NOVEMBER 2021

(CUCBCSS—UG)

Electronics

ELE 5D 03—ELECTRONIC FUNDAMENTALS

Time : Two Hours Maximum : 40 Marks

Section A

Answer all questions.

Each question carries 1 *mark.*

1. Henry is the unit of ————.
2. EMF stands for ————.
3. Example for automobile battery is ————.
4. The time period of a sine wave of frequency 1 kHz is ————
5. When three 33 kΩ resistors are connected in parallel, the equivalent resistance will be ————.

(5 × 1 = 5 marks)

Section B

Answer **all** *questions.*

Each question carries 2 *marks.*

6. Define self inductance of a coil.
7. How much kWh energy is consumed when an LED bulb of 15W and a filament bulb of 60W are worked continuously for 5 hours ?
8. What are secondary batteries ?
9. Give the working principle of a transformer. What is a step down transformer ?
10. State Ohm's law.

(5 × 2 = 10 marks)

Section C

Answer any **three** *questions.*

Each question carries 5 *marks.*

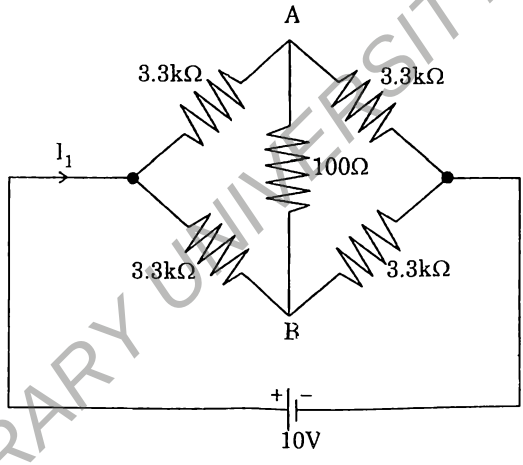
11. List the applications of lead acid batteries.

12. Write short notes on phase and frequency of an alternating quantity.

13. Explain with the help of suitable diagrams, how alternating voltage is generated ?

14. State KCL and KVL.

15. In the circuit shown in figure, find the value of I_1 and voltage across AB.



(3 × 5 = 15 marks)

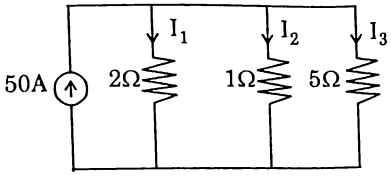
Section D

Answer any **one** *question.*

Each question carries 10 *marks.*

16. Explain the charging and discharging process of a lead acid cell.

17. Using KCL, find the values of I_1, I_2 and I_3.



18. Write the working of a battery charger.

(1 × 10 = 10 marks)

D 10157 (Pages : 2) Name.....

Reg. No.....

FIFTH SEMESTER U.G. DEGREE EXAMINATION, NOVEMBER 2021

(CUCBCSS—UG)

Electronics

ELE 5D 02—DIGITAL FUNDAMENTALS

Time : Two Hours Maximum : 40 Marks

Section A

Answer **all** *questions.*

Each question carries 1 *mark.*

1. Convert the decimal number 34 to BCD.
2. Identify the type of gate used, from the equation $x = \bar{A}B + A\bar{B}$.
3. What is the binary equivalent of the octal number 64_8 ?
4. A Karnaugh map is a systematic way of reducing which type of expression ?
5. Find 1's complement of binary number 11010_2.

(5 × 1 = 5 marks)

Section B

Answer **all** *questions.*

Each question carries 2 marks.

6. Simplify the Boolean expression C (A + B) + A (A + C) + BC.
7. Draw the logic circuit for the Boolean expression $Y = \bar{C}(A\bar{B} + D)$.
8. Add the binary numbers 1101_2 and 0110_2.
9. Obtain the truthtable of a Full Adder.
10. Discuss the operation of SR flip flop.

(5 × 2 = 10 marks)

Section C

Answer any **three** *questions.*
Each question carries 5 *marks.*

11. State and Prove De Morgan's theorems. Draw the gate equivalent.

12. Realize AND , OR, NOT gates by using NOR gate.

13. Reduce the expression $f = \sum_m (0, 2, 3, 4, 5, 6)$ using K Map and implement the logic circuit.

14. Write a short note on Binary Coded Decimal (BCD) ?

15. What are the classifications of registers depending upon the way of data shifting. Illustrate the process of data shifting in various types ?

(3 × 5 = 15 marks)

Section D

Answer any **one** *question.*
It carries 10 *marks.*

16. What is race around condition. With neat diagram explain the working of a master-slave JK-flip flop.

17. Draw and explain the working of a mod 10 asynchronous counter.

18. (a) Reduce the expression $f = \sum_m (0, 1, 2, 3, 5, 7, 8, 9, 12, 13)$ using K map and implement logic circuit.

    (b) State and prove the Commutative, Associative and distributive laws associated with Boolean algebra.

(1 × 10 = 10 marks)

FIFTH SEMESTER U.G. DEGREE EXAMINATION, NOVEMBER 2021

(CUCBCSS—UG)

Electronics

ELE 5D 01—COMPUTER HARDWARE

Time : Two Hours Maximum : 40 Marks

Part A

Answer **all** *questions.*
Each question carries 1 *mark.*

1. What determines the speed of operation of a computer.
2. A + 1 = ————.
3. Write the expansion of ASCII.
4. Name a pointing device used in a computer system.
5. How many memory locations can be addressed using 16 address lines ?

(5 × 1 = 5 marks)

Part B

Answer **all** *questions.*
Each question carries 2 *marks.*

6. Convert the hexadecimal number into decimal F1.
7. Define bus with respect to a computer.
8. What are the components of a digital computer ?
9. What is a multicore system ?
10. Perform the following binary addition :

    1010 + 0111

(5 × 2 = 10 marks)

Part C

Answer any **three** *questions.*
Each question carries 5 *marks.*

11. Explain 2's complement with an example.
12. Explain the rules of binary addition.

13. Write notes on touch screen displays.

14. How are computers classified ?

15. What is the CPU of a computer ?

(3 × 5 = 15 marks)

Part D

Answer any **one** *question.*
The question carries 10 *marks.*

16. Explain the steps and tools involved in a computer program development.

17. Explain the basic logic gates in detail.

18. Explain the generations of computers.

(1 × 10 = 10 marks)

D 10155 (Pages : 4) Name.....

Reg. No.....

FIFTH SEMESTER U.G. DEGREE EXAMINATION, NOVEMBER 2021

(CUCBCSS—UG)

Electronics

ELE 5B 09—NETWORK THEORY

Time : Three Hours Maximum : 80 Marks

Part A

Answer **all** *questions.*
Each question carreis 1 *mark.*

1. What is the inductance of a coil having 10 Ω reactance at 50 Hz
2. Draw the frequency characteristic of Band stop filter.
3. Superposition theorem can be applied to ———— networks.
4. The time constant of a series RL circuit is :
5. State Millman's theorem.
6. In case of purely capacitive circuit, average power = ———— and θ = ————
7. The cutoff frequency of an LPF with RC configuration is 500 Hz. Assuming R = 500 ohm .Find the value of C.
8. In a certain parallel resonant band pass filter, the resonant frequency is 14 KHz and band width is 4 KHz and the lower frequency is ———.
9. What is power factor ?
10. In a series circuit having resistance and inductance, the quality factor is ?

(10 × 1 = 10 marks)

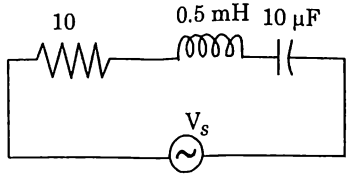
Part B

Answer any **five** *question.*
Each question carries 2 *marks.*

11. What is band pass filter and draw its frequency characteristics ?

Turn over

12. Determine the resonant frequency (kHz) for the circuit shown below :



13. State reciprocity theorem and write it's limitation.

14. Draw a constant K T section and π Section low pass filter.

15. A 30 F capacitor is connected to a 240 V, 60 Hz circuit. What is the current flow in this circuit ?

16. Differentiate steady state and transient response.

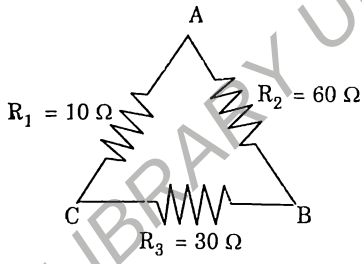
17. Distinguish between Mesh and Loop.

(5 × 2 = 10 marks)

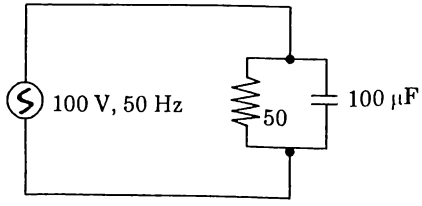
Part C

Answer any **six** *questions.*
Each question carries 5 *marks.*

18. Calculate the resistances of delta network, which are equivalent to that of star network :



19. Find the impedance in the circuit shown below :



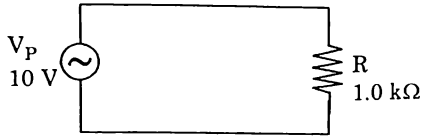
20. State and Explain Kirchhoff's voltage and current law :

21. A sinusoidal voltage is applied to the resistive circuit. Determine the following :

(a) I_{rms}. (b) I_{AVG}.

(c) I_P. (d) I_{P-P}.

(e) i at the positive peak.



22. What is Norton's theorem how do you find Norton's current and resistance in a circuit.

23. Draw and explain the impedance diagram of series RL circuit.

24. Derive a relation between voltage and current in an AC circuit containing capacitor.

25. Draw the circuit and characteristics of T and π configuration Low Pass Filter.

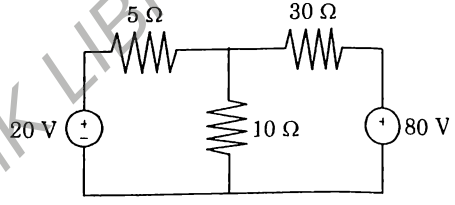
(6 × 5 = 30 marks)

Part D

Answer any **two** *questions.*

Each question carries 15 *marks.*

26. Find the voltage across 30 Ω resistor using Mesh analysis.

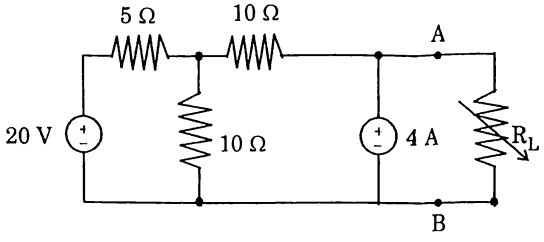


27. Draw and Explain the T and π configuration of Band pass filter and draw its characteristics.

28. Discuss the D.C. transient analysis of RL circuit.

29. (a) State and prove maximum power transfer theorem.

(b) Find the maximum power that can be delivered to the load resistor RL of the circuit :



(2 × 15 = 30 marks)

D 10154 (Pages : 2) Name.....

Reg. No.....

FIFTH SEMESTER U.G. (CUCBCSS-UG) DEGREE EXAMINATION NOVEMBER 2021

Electronics

ELE 5B 08—MICROCONTROLLER 8051

Time : Three Hours Maximum : 80 Marks

Part A

Answer **all** *questions.*

1. On power up 8051 uses RAM location ———— as the first location of the stack.
2. Name a 16 bit register in 8051.
3. UMP is a ———— byte instruction.
4. What is the dual role of port 2 ?
5. How many general purpose registers are in 8051 ?
6. What is power down mode ?
7. What is the function of TMOD register ?
8. The timers of 8051 are ———— bit.
9. What does SWAP instruction do ?
10. State whether address bus of any microcontroller is unidirectional .Justify your answer.

(10 × 1= 10 marks)

Part B

Answer any **five** *questions.*
Each question carries 2 *marks.*

11. Explain the alternative functions of port 3 in 8051 microcontroller.
12. Show the contents of PSW register after the execution of the following instructions :

    MOV A,#BF H

    ADD A,#1B H
13. Give any four features of 8051 microcontroller.
14. Draw the format of PCON register.
15. What are the control pins of the LCD ?

16. What voltage levels are used for binary 0 in in RS 232 ?

17. Write a program to clear 16 RAM location starting at RAM address 60H.

(5 × 2 = 10 marks)

Part C

Answer any **six** *questions.*
Each question carries 5 *marks.*

18. Explain the register banks in 8051 microcontroller.

19. Draw a functional schematic to interface an 8 bit ADC to a microcontroller.

20. Describe the different modes of serial communication in 8051.

21. Draw and explain TCON register.

22. Explain how stack is implemented in 8051.

23. Explain IP and IE register in 8051.

24. Explain unconditional jump instruction with an example.

25. Compare microprocessor and microcontroller with an example.

(6 × 5 = 30 marks)

Part D

Answer any **two** *questions.*
Each question carries 15 *marks.*

26. Draw and explain the internal architecture of 8051 microcontroller.

27. (a) Explain the data transfer (internal and external) instructions in 8051. (8 marks)

    (b) Explain bit manipulation instructions in 8051 (7 marks)

28. (a) Explain the timer operating modes in 8051 (10 marks)

    (b) What is vectored interrupts and Write vector table of 8051 interrupts ? (5 marks)

29. (a) With a neat diagram explain the interfacing of LCD with 8051 microcontroller (10 marks)

    (b) Draw the matrix keyboard connection to 8051 ports (5 marks)

(2 × 15 = 30 marks)

D 10153 (Pages : 2) Name.....

Reg. No.....

FIFTH SEMESTER U.G. DEGREE EXAMINATION, NOVEMBER 2021

(CUCBCSS—UG)

Electronics

ELE 5B 07—ELECTRO MAGNETIC THEORY

Time : Three Hours Maximum : 80 Marks

Part A

Answer **all** *questions.*
Each question carries 1 *mark.*

1. What is gradient of a scalar field ?
2. Mention the unit vectors of cylindrical coordinate system.
3. Write the relation between Electric field intensity and Electric potential.
4. What is the SI unit of Electric Potential ?
5. Write the relation between magnetic flux density and magnetic field intensity.
6. Linear polarization can be obtained only if the wave consists of ————.
7. The ratio of magnitudes of electric field intensity to the magnetic field intensity is considered as ————.
8. Mention the theorem that gives the relation of energy transfer between the electric and magnetic fields.
9. Give an expression for the energy stored in a capacitor.
10. What is an isotropic radiator ?

(10 × 1 = 10 marks)

Part B

Answer any **five** *questions.*
Each question carries 2 *marks.*

11. State Coulombs law.
12. Express spherical coordinates in terms of rectangular Cartesian coordinates.
13. Define Electric field intensity.
14. What is the physical significance of Curl of a vector field ?

15. What is a TEM wave ?

16. Define polarisation.

17. Write the Maxwell's equations in point form.

(5 × 2 = 10 marks)

Part C

Answer any **six** *questions.*
Each question carries 5 *marks.*

18. What are the different types of polarization ?

19. State and prove Gauss Law.

20. Compare conduction current and displacement current.

21. Explain Faradays' laws of electromagnetic induction and obtain its differential form.

22. What are the boundary conditions for magneto static fields ?

23. Explain the inconsistency of Amperes circuital law.

24. What is magnetic vector potential ?

25. Derive Poisson's equation.

(6 × 5 = 30 marks)

Part D

Answer any **two** *questions.*
Each question carries 15 *marks.*

26. Explain Coulombs Law. Point charges 5nC and 1nC are located at (2, 0, 4) and (1, –3, 7), respectively. Determine the force acting on the 1nC charge.

27. Derive an expression for the force between two parallel current carrying conductors.

28. State, Prove and Explain Poynting Theorem.

29. Derive the electrostatic boundary conditions at the interface of two dielectrics.

(2 × 15 = 30 marks)

D 92399 **(Pages : 2)** **Name**.....

Reg. No.....

FIFTH SEMESTER U.G. (CUCBCSS—UG) DEGREE [SPECIAL] EXAMINATION, NOVEMBER 2020

Electronics

ELE 5D 01—COMPUTER HARDWARE

Time : Two Hours Maximum : 40 Marks

Part A

All questions to be attended.
Each question carries 1 *mark.*

1. Express the decimal format of the signed binary number $(10010)_2$.
2. What is the minimum number of bits sufficient to represent a hexadecimal number in binary.
3. What is the high speed memory between the main memory and the CPU called ?
4. A A'= ————.
5. How many characters are there in ASCII ?

(5 × 1 = 5 marks)

Part B

All questions can be attended and overall ceiling.
Each question carries 2 *marks.*

6. What is the word length of a computer ?
7. What is an assembler ?
8. Obtain the hexadecimal equivalent of $(2020)_{10}$.
9. What is one's complement ?
10. Give the output sequence if the following two sequences are fed as inputs A,B to an AND gate.

    A) 110101.

    B) 101010

(5 × 2 = 10 marks)

Part C

All questions can be attended and overall ceiling.
Answer any **three** *questions.*
Each question carries 5 *marks.*

11. Perform the following arithmetic operation using two's complement method.
$(20)_{10} - (16)_{10}$.
12. Write notes on CRT display.
13. Explain compiler.
14. Explain a multiprocessor system.
15. Explain the bus structure of a computer.

(3 × 5 = 15 marks)

Part D

All questions can be attended and overall ceiling.
Answer any **one** *of the following.*
The question carries 10 *marks.*

16. Explain the various input devices.
17. Explain with block diagram the functional units of a computer.
18. Explain the evolution of computers.

(1 × 10 = 10 marks)