

Question Bank:

Electronics : M.Sc.I Semester-II

8 bit Microcontrollers and Applications (MET201)

Subject Code: 98105

2 Marks Question

1. How many clock pulses are confined by each machine cycle of Peripheral-Interface Controllers?
2. What is mean by ALU?
3. What is long form of RISC.
4. What is the default address location of Stack Pointer after power on reset AVR MCU
5. What is the size of Program Counter in AVR?
6. How many I/O pins does 8051 microcontroller have?
7. Using PIC micro controller how is analog signal is converted into digital signal?
8. What is flash memory?
9. What are interrupts available in PIC micro controller
10. Which port will support for external interrupt in PIC.
11. Draw the bit pattern for configuring the USART.
12. What is the main function I2C interface?
13. What are the main difference flash memory & EEPROM?
14. Mention the special functions of PORTA.
15. Why flash memory is mostly preferred than other memory? 10. What is key debouncing?
16. What is RISC architecture?
17. How many clock pulses are required by each machine cycle of PIC MCU?
18. Define ALU in microcontroller?
19. Define RISC architecture in computer.
20. What is the default address location of PSW, After power on reset PIC MCU
21. What is the size of Program Counter in PIC18F452 microcontroller ?
22. What is RISC architecture?
23. What are the timer modes in PIC?
24. List the function of I/O ports in PIC.
25. What is C Compiler?
26. What is CCP module

27. What is bit size of Atmega16/32?
28. What is long form of CISC.
29. What is the default address location of Stack Pointer after power on reset Atmega16/32?MCU
30. How many on-chip ADC did Atmega16/32 MCU have?

6 Marks Question

1. Enlist the features of PIC microcontroller and explain one of them with neat block diagram.
2. Draw and explain simplified view of PIC18 MCU architecture.
3. Enlist the features of AVR microcontroller; explain one of them with neat block diagram.
4. Discuss 5 sources of reset mechanism for AVR microcontroller and explain reset logic with diagram.
5. Explain addressing modes of PIC microcontroller with examples.
6. Draw and explain simplified view of 8051 MCU architecture
7. Enlist the features of 8051 microcontroller; explain one of them with neat block diagram.
8. Draw and explain the architecture of on chip ADC of PIC micro controller in detail write a suitable assembly language program for configuring the ADC in PIC microcontroller.
9. Draw and explain the PIC18 MCU instruction pipeline & mention its significance.
10. A switch is connected to pin RC0. Write a program to check the status of SW and do the following function . If SW =0, send letter 'G' to PORTB.; If SW=1, send letter 'S' to PORTB
11. With a neat diagram discuss in detail about the architecture of PIC micro controller.
12. Discuss in detail about the function of various port pin of Atmega16/32 micro controller
13. Explain the different addressing modes of AVR micro controller.
14. Discuss in detail about the memory organization of AVR micro controller.
15. Discuss about the various function of PORT in AVR micro controller.

16. Write a program to read the data, convert to ASCII and displays it in a micro controller.
17. Draw and explain the instruction pipeline & mention its significance.
18. Write a program in PIC micro controller to multiplying 'N' byte numbers.
19. Explain the RAM and ROM allocation PIC 18F4520.
20. Write a program in AVR micro controller to multiplying 'N' byte numbers.
21. Write an assembly language program to add two numbers stored in location 07H & 08H.
22. Explain in detail about the compare and capture mode of the PIC micro controller with a neat diagram.
23. Write a detailed note on the FLASH & EEPROM memories.
24. Explain the UART in PIC micro controller.
25. Write a detailed note on I2C bus.
26. Write a detailed note on ADC0804 chip.
27. Explain the I2C communication protocol in AVR microcontroller
28. A switch is connected to pin RC3. Write a program to check the status of SW and do the following function . If SW =1, send letter 'O' to PORTB.; If SW=0, send letter 'N' to PORTB
29. Explain the UART in AVR micro controller to send and receive data.
30. Discuss the timer 0 operations and write the steps to initialize them stating appropriate control words in the associated SFRs.

4 Marks Question

1. What are the benefits of having RISC architecture?
2. Write a note on PIC18 Status register.
3. With neat block diagram, explain organization of PIC18 file register.
4. Compare RISC vs. CISC architecture in Microcontroller.
5. Write a note on concept of pipelining.
6. What is the importance of Status register in MCU.
7. Write C program to convert packed BCD 0x94 to ASCII .
8. Discuss key debouncing with suitable C program.
9. While programming for LCD display, what initialization has to be done?
10. What are the aspects taken into account while keyboard is integrated?

11. For the H-bridge configured connected to a motor, how do control signal are applied from the micro controller.
 12. Write a note on software technique for key debouncing?
 13. What is meant by data acquisition system?
 14. What are the advantages of LCD over LED display?
 15. What is meant by resolution of a ADC converter?
 16. What is PWM, and how it is used in DC motor speed control?
 17. List out the signals used in keypad interfacing.
 18. What is Embedded System ? Write down five application of Microcontroller.
 19. Write a suitable assembly language program for configuring the ADC.
 20. What are the PIC 18 family device?
 21. Give the role of watchdog timer in AVR microcontroller.
 22. Write an AVR C program to toggle all the pins of Port B continuously.
 23. Write a PIC C program for speed control of DC motor using PWM.
 24. Write a note on WREG in PIC MCU.
 25. Write a PIC C program to toggle all the pins of Port B continuously.
 26. Write an AVR C program for speed control of DC motor using PWM.
 27. With interfacing diagram, explain seven-segment interfacing with PIC microcontroller.
 28. Write a note on logical operator for PIC MCU?
 29. Write a note on basic input as Key interfacing with suitable PIC MCU C program.
 30. With neat block diagram, explain organization of AVR file register.
 31. Give the role of watchdog timer in AVR microcontroller.
 32. Briefly explain the sensor interfacing using PIC micro controller.
 33. Write a PIC C program to toggle all the pins of Port E continuously.
 34. Discuss the speed control of DC motor using PWM technique .
 35. Discuss the on-chip oscillator of AVR microcontroller.
 36. Write a note on basic input as Key interfacing with suitable AVR MCU C program.
 37. What is the advantage of instruction pipelining?
 38. Which are the technique to speed up the controller ?
 39. What are the PIC 18 family device?
 40. Write a note on logical operator for AVR MCU?
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UNIT I: Electromagnetic Waves

Q. 1) Two Marks

- 1) Define Field Theory
- 2) Define Circuit Theory
- 3) Give the sources of electric field and magnetic field
- 4) State Divergence Theorem with expression.
- 5) State Stokes theorem with expression.
- 6) State Gauss's law.
- 7) Define magnetic flux density
- 8) Define permeability
- 9) Define Electric flux density.
- 10) Write wave equations at free-space Condition.
- 11) Write Maxwell's Curl equation in Integral Form
- 12) Write Maxwell's Divergence equation in Integral Form
- 13) State Poynting theorem.
- 14) Give the characteristic impedance of free space with formula.
- 15) Write the Vector Helmholtz equations.
- 16) Define depth of Penetration
- 17) Give the expression for velocity of electromagnetic signal in lossless medium

UNIT II: Transmission Line

- 18) Write four types of transmission line.
- 19) Enlist the distributed constants and its units of transmission line
- 20) Write down equation of propagation constant for uniform transmission line.
- 21) Draw the schematic for Distributed parameters of a two-conductor transmission line
- 22) Give the expression for inductance per unit area at high frequency for coaxial and two wire line
- 23) Give the correct expression for Skin depth of the conductor.
- 24) Write general expression of propagation constant and characteristic impedance for transmission line.
- 25) Give the reflection coefficient and SWR for the Shorted, open-circuited and Matched line

- 26) Draw Smith chart for typical x-circles for $x = 0 \pm 1/2, \pm 1, \pm 2, \pm 5, \pm \infty$.
- 27) Draw Smith chart for typical r-circles for $r = 0, 0.5, 1, 2, 5, \infty$.
- 28) Define reflection coefficient of uniform transmission line.

UNIT III: Waveguide and Components

- 29) Draw a rectangular waveguide with perfectly conducting walls, filled with a lossless material.
- 30) Define cut off frequency of waveguide
- 31) Enlist four different mode categories exists in waveguides.
- 32) Define power loss in rectangular waveguide.
- 33) Write Power transmission equation in rectangular waveguide.
- 34) Define susceptibility in optical fiber.
- 35) Define numerical Aperture on optical fiber
- 36) Define quality factor for waveguide resonator.

UNIT IV: Electromagnetic Radiation

- 37) Define radiation pattern of antenna
- 38) Define directive gain of antenna
- 39) Define directivity of antenna
- 40) Define power gain of antenna
- 41) Write expression for effective area of antenna
- 42) Write an RADAR transmission equation

Q. 2/3/4) Six marks

UNIT I: Electromagnetic Waves

- 1) Discuss vector analysis for Multiplication of a scalar and a vector.
- 2) Derive an expression for Electric field strength E using Coulomb's Law.
- 3) State and prove Gauss's Law for displacement of charges in field.
- 4) Explain Line Surface and Volume Integrals with neat labeled diagrams.
- 5) Derive expressions for Magnetic field strength H and Magnetomotive force F.
- 6) Obtain the relation between E and H in a uniform plane wave.
- 7) Discuss the conditions at a boundary surface.
- 8) Write Maxwell's equations in differential and integral forms. Write the word statements of curl equations.
- 9) Derive Wave equations for electric and magnetic fields in free-space conditions.

- 10) Explain uniform plane wave propagation.
- 11) Derive expressions for Helmholtz equation for conducting medium.

UNIT II: Transmission Line

- 12) With neat labeled diagram discuss Transmission line Parameters for Two conductor transmission line.
- 13) Derive equations of currents and voltages for two wire transmission line.
- 14) Derive expressions for Input impedance in lossy and lossless transmission line
- 15) A transmission line operating at 500 MHz has $Z_0 = 80 \Omega$, $\alpha = 0.04 \text{ Np/m}$, $\beta = 1.5 \text{ rad/m}$. Find the line parameters R, L, G, and C.
- 16) Answer: $3.2 \text{ } \Omega/\text{m}$, 38.2 nH/m , $5 \times 10^{-4} \text{ S/m}$, 5.97 pF/m .
- 17) A distortionless line has $Z_0 = 60 \Omega$, $\alpha = 20 \text{ mNp/m}$, $u = 0.6c$, where c is the speed of light in a vacuum. Find R, L, G, C, and X at 100 MHz.
- 18) Answer: $R=1.2 \text{ } \Omega/\text{m}$; $L=333 \text{ nH/m}$; $G=333 \mu\text{S/m}$; $C=92.59 \text{ pF/m}$
- 19) An air line has characteristic impedance of 70Ω and phase constant of 3 rad/m at 100 MHz. Calculate the inductance per meter and the capacitance per meter of the line. (Ans: $C=68.2 \text{ pF/m}$; $L= 334.2 \text{ nH/m}$)

UNIT III: Waveguide and Components

- 20) Discuss solution of wave equation in rectangular coordinates.
- 21) Discuss TE Modes in Rectangular Waveguides.
- 22) Discuss TM Modes in Rectangular waveguides.
- 23) Evaluate TM Mode to z for waveguide resonator
- 24) Explain TE mode to z For waveguide resonator
- 25) Explain Circular Waveguide with neat labeled diagram.

UNIT IV: Electromagnetic Radiation

- 26) Discuss physical structure and working of Reflex Klystron oscillator.
- 27) Discuss physical structure and working of Gunn effect diodes
- 28) Discuss physical structure and working of magnetron oscillator.
- 29) Derive expression of RADAR range equation
- 30) Discuss Antenna Arrays
- 31) What are the antenna Characteristics? Discuss Antenna patterns.

Q. 4) four marks

UNIT I: Electromagnetic Waves

- 1) Write a note on dot product.
- 2) Write a note on cross product.
- 3) Derive poisson's and Laplace's equations.
- 4) Explain Divergence theorem.
- 5) Explain magnetic induction and Faraday's law.
- 6) Write Maxwell's equations in differential and integral forms
- 7) Write conditions at a boundary surface.
- 8) Derive Wave equations for Conducting medium.
- 9) Explain the Poynting's theorem.
- 10) Write four vector Identities.
- 11) Explain skin depth.
- 12) State and prove stokes theorem
- 13) Write the expressions for propagation constant phase constant velocity and intrinsic impedance for wave propagation in good conductor.
- 14) Derive the equation of continuity for time varying field.
- 15) Explain use of orthogonal functions and relations with Laplace equation.

UNIT II: Transmission Line

- 16) Explain Distortion less line ($R/L=G/C$)
- 17) Explain Voltage reflection coefficient at load.
- 18) Explain Voltage reflection coefficient at any point.
- 19) Derive expression for SWR.
- 20) Write a short note on Smith Chart
- 21) Write a note on Single stub tuner (Matching)
- 22) Explain Microstrip transmission lines.
- 23) Find the return loss due to a 150 ohm cable terminated by a 100 ohm load.
- 24) Express the phase velocity on a lossless line in terms of C and Z_0
- 25) Write a note on transmission line parameter.
- 26) Explain the lossless line parameters.
- 27) Explain the smith chart.
- 28) Write a note on Single stub Tuner
- 29) Explain transmission line as an circuit elements.

- 30) A certain microstrip line has fused quartz ($\epsilon_r = 3.8$) as a substrate. If the ratio of line width to substrate thickness is $w/h = 4.5$, determine (a) The effective relative permittivity of the substrate (b) The characteristic impedance of the line (c) The wavelength of the line at 10 GHz. **Answer: a) 3.131; b) 9.576 Ω ; c) 16.9 mm**

UNIT III: Waveguide and Components

- 31) Write a short note on Mode categories in waveguides.
32) Explain Power transmission in rectangular waveguide.
33) Explain Power loss in rectangular Waveguide.
34) Write a short note on excitations of modes in rectangular waveguide.
35) Draw and explain a typical fiber optic system.
36) Derive expression for attenuation in optical fiber
37) Derive expression for cutoff wavelength in TM mode for rectangular waveguide
38) Draw the field configurations for TM_{21} and TM_{32} mode of rectangular waveguide.

a) UNIT IV: Electromagnetic Radiation

- 39) Write a note on antennas
40) Explain Concept of near zone and radiation zone
41) Write a short note on potentials of electromagnetic fields.
42) Explain signal to noise ratio (SNR) of Antenna
43) Explain power gain of an Antenna
44) Discuss Microstrip patch antenna
45) Discuss horn antenna
46) Discuss yagi-uda antenna

M.Sc. - I (Sem- II)
ELECTRONICS
Power Electronics (Paper MET: 203)

Question Bank

2 Marks

1. Enlist types of synchronous motor.
2. Enlist types of DC motor.
3. Define BLDC motor?
4. Define micro stepping in stepper motor.
5. Define full stepping in stepper motor.
6. Define half stepping in stepper motor.
7. Enlist types induction motor.
8. Define chopper.
9. Define constant pulse width variable frequency.
10. State control strategies.
11. Give classification of chopper.
12. Comparison of class A and Class B chopper.
13. Draw diagram of step-down resistive load chopper
14. Draw a diagram of step up chopper.
15. Enlist types of Chopper.
16. Give classification of inverter based on configurations.
17. Give classification of inverter based on power semiconductor device used.
18. Enlist the different types of inverter based on nature of output.
19. Draw diagram of thyristorized half bridge inverter.
20. Advantages of PWM inverter.
21. Define Quasi-square wave inverter.
22. Define transistorised inverter.
23. Advantages of MPWM inverter.
24. Comparison of square wave and quasi square wave.
25. Disadvantages of MPWM inverter.
26. Draw neat labelled diagram of Bedford inverter.
27. Define is forced commutated thyristor inverters?
28. Draw neat labelled diagram of Resonant DC link inverter.
29. Draw neat labelled diagram of Mc-Murray full bridge Bedford inverter.
30. Draw neat labelled diagram of series resonant inverter with unidirectional switch.

4 Marks

1. Explain torque versus speed characteristics of a dc shunt motor.
2. Explain torque versus current characteristics of a dc shunt motor.
3. Explain speed versus current characteristics of a dc shunt motor.

4. Explain torque versus speed characteristics of a dc series motor.
5. Explain torque versus current characteristics of a dc series motor.
6. Explain speed versus current characteristics of a dc series motor.
7. Write a note on Induction Motor.
8. Explain speed versus torque characteristics of a three phase induction motor.
9. Explain the synchronous motor.
10. Explain concept of half step in stepper motor.
11. Explain concept of full step in stepper motor.
12. With neat labelled diagram, explain type A-chopper.
13. Explain type A-chopper with modes of operation.
14. With neat labelled diagram, explain type C-chopper.
15. With neat labelled diagram, explain type B-chopper.
16. Explain pulse width modulation.
17. Explain frequency modulation.
18. Explain current limit control.
19. Difference between different control strategies of a chopper.
20. Explain various control strategies of varying the duty cycle in choppers.
21. Comparison of step-up and step-down chopper.
22. Explain resonant pulse chopper.
23. Explain half-bridge inverter with resistive load.
24. Comparison of half-bridge and full-Bridge inverter.
25. Draw and explain Quasi-square wave inverter with resistive load.
26. Explain sinusoidal pulse width modulation with waveform.
27. Explain sinusoidal PWM Technique in voltage control of single-phase inverter.
28. Explain modified sinusoidal pulse width modulation with waveform.
29. Explain modified sinusoidal PWM Technique in voltage control of single-phase inverter.
30. Explain Multiple Pulse Width Modulation Technique in voltage control of single-phase inverter.
31. Discuss push pull inverter.
32. With neat labelled diagram explain push pull inverter.
33. Advantages and disadvantages of sinusoidal PWM Technique.
34. Discuss Single pulse width modulation.
35. Discuss Parallel resonant inverters.
36. Explain parallel resonant inverter with the help of neat labelled diagram.
37. Explain Series resonant inverter with unidirectional switch.
38. State and explain series resonant inverter with unidirectional switches.
39. Explain Series resonant inverter with bidirectional switch
40. Discuss in brief series resonant inverter with bidirectional switches.
41. Discuss Current source inverter.
42. Explain Resonant DC link inverter.
43. Give the complete explanation on resonant DC-link inverter with the help of its circuit diagram and waveforms.
44. Comparison of voltage source inverter and current source inverter.
45. Explain principle operation of CSI.

6 Marks

1. State and explain types of DC motor.
 2. Discuss characteristics of dc compound motor.
 3. Explain construction and working of stepper motor.
 4. Explain torque versus speed characteristics of a synchronous motor.
 5. Discuss characteristics of dc synchronous motor.
 6. Define synchronous motors and explain Construction and working of synchronous motors.
 7. Explain Construction and working of synchronous motors.
 8. Discuss interfacing technique of stepper motor with PC and digital circuit.
 9. Explain step-up chopper and draw its corresponding waveforms and derive the equation for output voltage.
 10. Explain in detail step-down chopper with corresponding waveforms.
 11. Give the hierarchy of choppers operating in different quadrants. Explain Type-E chopper.
 12. Give the hierarchy of choppers operating in different quadrants. Explain Type-D chopper.
 13. With neat labelled diagram, explain type D-chopper.
 14. Explain PWM and variable frequency system control strategies for varying duty cycle of chopper.
 15. Explain Half-Bridge inverter with inductive load.
 16. Explain the working of single phase bridge inverter with RL load.
 17. With neat labelled diagram, explain transistor based single phase bridge inverter and draw the corresponding waveforms.
 18. Explain the working of single phase full bridge inverter.
 19. Describe the working of Quasi-square wave inverter with RL load.
 20. Discuss three phase inverter and draw the corresponding waveforms.
 21. Explain the working of push pull inverter and draw the corresponding waveforms.
 22. Explain Modified McMurray Half-Bridge inverter with its all operating modes and draw the corresponding waveforms.
 23. Explain Modified McMurray full-Bridge inverter with its all operating modes and draw the corresponding waveforms.
 24. Explain the auxiliary commutated inverter with the help of mode-I and mode-II.
 25. Draw neat labelled diagram of Bedford inverter and explain it.
 26. Explain the Mc-Murray Bedford inverter.
 27. Discuss Complementary commutated inverters.
 28. Give brief explanation of Modified McMurray Full-Bridge inverter with its all operating modes and draw the corresponding waveform.
 29. Draw and explain Series resonant inverter with bidirectional switch.
 30. Explain the Mc-Murray Bedford Half-Bridge inverter.
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M.Sc. - I (Sem- II)
ELECTRONICS
Fiber Optic communication system (Paper MET: 204)

Question Bank

2 Marks

1. State Snell's law
2. Define critical angle.
3. Define Meridional rays.
4. Define attenuation.
5. State acceptance angle.
6. Define Skew rays.
7. Define Single Mode fiber optics.
8. Define multiple Mode fiber optics.
9. Define Phase velocity.
10. Define Loose tube?
11. Define Capillary?
12. Define spring groove.
13. Define fiber optic communication.
14. State advantages of optical fiber communication.
15. State disadvantages of optical fiber communication.
16. Define Optical switch?
17. Define optical multiplexer.
18. Define optical demultiplexer.
19. Define Beam splitter?
20. Define Optical Power Meter?
21. Define WDM .
22. Define DWDM
23. List application of LASER used in industries.
24. List application of LASER used in medical surgery.
25. Define Multiplexing in optical fiber
26. Define Point-to- Point Links
27. Define transmission distance
28. Define Line Coding in Optical Links
29. Define Eye Pattern
30. Define Single Mode Fibers

4 Marks

1. Explain step index fibers.
2. Explain Graded index fibers.
3. Differentiate between step index and Graded index fiber.
4. Explain bending loss.
5. Give an idea about numerical aperture in optical fiber cable
6. Explain intrinsic absorption losses.
7. Explain extrinsic absorption losses.
8. What is attenuation and give its unit
9. Write a note on single mode and multimode optical fiber.
10. Discuss dispersion shifted fibers.
11. Discuss dispersion flattened fibers.
12. Explain scattering losses.
13. State and explain applications of optical fiber communication.
14. Draw and explain laser driver circuit digital communication.
15. Draw and explain LED driver circuit digital communication.
16. Difference between LED driver circuit and Laser driver circuit in optical fiber communication.
17. Explain Fresnel reflection in optical fiber communication.
18. Discuss Process of connecting the fibre cable with connectors.
19. Explain Slotted core.
20. Explain in detail regarding optical fiber Mechanical splices.
21. Draw and explain the detailed block diagram of optical fiber communication system.
22. Discuss Ferrule and Expanded beam.
23. Draw and explain LASER driver analog circuit of optical fiber.
24. Explain Beam splitter.
25. Discuss Beam splitter.
26. Explain Optical Amplifiers-Semiconductor.
27. Explain optical amplifier.
28. Explain Raman amplifier.
29. Explain Optical wavelength Converter.
30. Explain EDFA.
31. Explain Optical Power Meter.
32. Explain in detail Optical Power Meter.
33. Explain in detail Optical switches.
34. Explain Optical Amplifiers-Semiconductor optical amplifier.
35. Discuss Measurement of attenuation in optical fiber.
36. Discuss Measurement of Dispersion in optical fiber
37. Explain Eye Pattern in optical fiber.
38. Discuss Transmission Distance in optical fiber
39. Discuss Line Coding in Optical Links in optical fiber.

- 40.State and explain types of WDM.
- 41.Explain Rise Time Budget with Examples.
- 42.Explain types of WDM in brief.
- 43.Discuss Transmission Distance in optical fiber
- 44.Explain Measurement of attenuation in optical fiber.
- 45.Write a note on Transmission Distance in optical fiber.

6 Marks

1. Explain in brief total internal reflection Ray propagation in step index fiber.
2. Explain in brief Micro and macro fiber bend losses.
3. Explain in detail different type of losses in OFC.
4. Explain in detail fiber bend losses and materials absorption losses in glass fiber.
5. Explain Intermodal Dispersion in multi-mode step index fiber.
6. Explain material dispersion.
7. Explain wave guide dispersion.
8. Explain in detail Numerical Aperture.
9. Draw and explain the detailed block diagram of optical fiber communication system. List its advantages and disadvantages.
- 10.Draw the block diagram of general communication system and fiber optics communication system? Explain in detail.
- 11.Draw and explain Optical receiver block diagram.
- 12.Draw and explain Optical transmitter block diagram.
- 13.Explain in detail regarding optical fiber splicing.
- 14.Explain in detail regarding optical fiber fusion splices.
- 15.Explain in detail regarding optical fiber Intrinsic Parameters.
- 16.Explain the operation of LED. Also explain different types of LED's and its different structures.
- 17.Explain population inversion in case of LASER.
- 18.Explain in detail types of isolators optical fiber.
- 19.Explain in detail Optical multiplexer.
- 20.Explain in detail Optical demultiplexer.
- 21.Explain in detail OTDR.
- 22.Explain in detail Optical time domain reflectometer.
- 23.Discuss applications of LASER used in various industries & medical surgery.
- 24.Discuss applications of working principle of Optical Power Meter.
- 25.Explain Link Power Budget with Examples?
- 26.Explain Single Mode Fiber Dispersion.

27. Explain Multi-Mode Fiber Dispersion.
28. Explain in detail Dispersion in Rise Time Budget with Examples.
29. Explain in detail Link Power Budget with Examples.
30. Discuss Line Coding in Optical Links.

Q.2) Attempt any one.

[16 M]

- a) Circuit diagram and explanation of Modified McMurray half-Bridge inverter (4 Marks). Explanation of all operating modes with waveform (12 Marks).
- b) Definition of chopper (2 Marks) Explanation of step-up and step-up chopper chopper with corresponding waveforms (14 Marks).

Q.3) Attempt any two.

[16 M]

- a) Hierarchy of choppers operating in different quadrants (2 Marks). Explanation of Type-B and Type-C chopper (6 Marks).
- b) Circuit diagram and explanation. (4 Marks) waveform and equation (4 Marks).
- c) Explanation of series resonant inverter with bidirectional switches and waveforms (8 Marks).

Q.4) Attempt any two.

[16 M]

- a) Explanation of auxiliary commutated inverter with the help of mode-I and mode-II. (8Marks)
- b) Explanation of sinusoidal PWM technique (4 Marks).and modified sinusoidal PWM Technique (4 Marks).
- c) Discussion on principle of switching mode regulator (2 Marks). Explanation of buck regulator (6 Marks).

Q.5) Attempt any four.

[16 M]

- a) Diagram and discussion on half bridge inverter with corresponding waveforms(4 Marks).
- b) Explanation of any one application of power electronics(4 Marks).
- c) With circuit diagram explanation of type D-chopper.(4 Marks).
- d) Waveform and explanation of Multiple Pulse Width Modulation Technique in voltage control of single-phase inverter(4 Marks).
- e) Explanation ofPWM(2 Marks)and variable frequency system control (2 Marks).

Q.2) Attempt any one.

[16 M]

- a) Complete explanation on resonant DC-link inverter with the help of its circuit diagram(12 Marks) and waveforms.(4 Marks)
- b) Circuit diagram (5 Marks), explanation of of three phase inverter (6 Marks).and the corresponding waveforms. (5 Marks).

Q.3) Attempt any two.

[16 M]

- a) Explanation of step-up chopper and with its corresponding waveforms (6 Marks) and equation for output voltage (2 Marks). Total 8 Marks
- b) Principle of cycloconverter(2 Marks)bridge type cycloconverter(6 Marks).
- c) Explanation of parallel resonant inverter with the help of neat labelled diagram. (8 Marks)

Q.4) Attempt any two.

[16 M]

- a) Hierarchy of choppers operating in different quadrants(2 Marks).
Explanation of Type-C and Type-D chopper(6 Marks).
- b) Multiple pulse width modulation (4 Marks) and sinusoidal pulse width modulation technique(4 Marks) in voltage control of single-phase inverter. (4 Marks)
- c) Principle of switching mode regulator (2 Marks) Explanation of buck-boost regulator (6 Marks).

Q.5) Attempt any four.

[16 M]

- a) Circuit diagram of Bedford inverter and explanation.(4 Marks)
- b) With neat labelled diagram explanation of push pull inverter.(4 Marks)
- c) Circuit diagram and explanation of type B-chopper.(4 Marks)
- d) Explanation of Phase Displacement Control Technique in voltage control of single-phase inverter.(4 Marks)
- e) Explanation of variable frequency system (2 Marks) and current limit control strategies (2 Marks) for varying duty cycle of chopper.

Q.2) Attempt any one.

[16 M]

- a) Circuit diagram (5 Marks), explanation of three phase inverter (6 Marks). and the corresponding waveforms. (5 Marks).
- b) Circuit diagram and explanation of Modified McMurray Full-Bridge inverter (4 Marks). Explanation of all operating modes with waveform (12 Marks).

Q.3) Attempt any two.

[16 M]

- a) Hierarchy of choppers operating in different quadrants(2 Marks). Explanation of Type-A and Type-B choppers (6 Marks).
- b) Explanation of parallel resonant inverter with the help of neat labelled diagram(8 Marks).
- c) Principle of switching mode regulator(2 Marks). Explanation of boost regulator(6 Marks).

Q.4) Attempt any two.

[16 M]

- a) Principle of cycloconverter (2 Marks). Explanation of single-phase to single phase mid-point cycloconverter (6 Marks).
- b) Explanation of series resonant inverter with unidirectional switches and waveforms (8Marks).
- c) Explanation of various control strategies (each 2 marks).

Q.5) Attempt any four.

[16 M]

- a) Circuit diagram and explanation of buck regulator.(4 Marks)
 - b) Circuit diagram and explanation of Type-E chopper. (4 Marks)
 - c) Single Pulse Width Modulation Technique with corresponding waveform.(4 Marks)
 - d) Explanation of half-bridge inverter with corresponding waveforms. (4 Marks)
 - e) Explanation of bridge type cycloconverter.(4 Marks)
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M. Sc.-I (Semester -II) Question Bank
ELECTRONICS
MET205:-Computer Networks

2 Marks

1. What is operating system
2. Define Kernel?
3. Define Shell?
4. Write the some common shells?
5. Define pipes?
6. Define relative path and absolute path?
7. Define variable types in UNIX shell?
8. Define computer network?
9. Define metropolitan area network (MAN)?
10. What is network architecture?
11. Define network topology.
12. Define apple talk.
13. Define serial and parallel data transmission?
14. Define TDM and FDM technique?
15. Give list of switching techniques.
16. What is mean by IEEE standards?
17. Define channel allocation.
18. Define IP address.
19. What is IP address format?
20. What is local broadcast address?
21. Give list of error reporting messages.
22. Draw header format of UDP.
23. Define local loop back address?
24. Draw the diagram of encapsulation and Decapsulation process.
25. Define FTP.
26. What is simple mail transfer protocol?
27. Define point to point network.
28. What is asynchronous data transmission?
29. Define synchronous serial data transmission.
30. What is internet?

4 marks

1. Explain advantages of UNIX features.
2. Explain types of UNIX file systems.
3. Explain some file management commands with examples.
4. Explain some directory manipulations commands with examples.
5. Describe shell script in UNIX os.
6. Explain variables in UNIX os.
7. Explain moving and renaming files commands.
8. Differentiate client server network and peer-peer network.
9. Explain characteristics of LAN network.
10. Differentiate between Ad-hoc and infrastructure networks.
11. Differentiate between bridge and repeater.
12. Explain concept of backbone structure of network.
13. Explain types of wireless LAN with neat diagrams.
14. What is the unguided transmission media.
15. Explain circuit switching technique.
16. Explain message switching technique.
17. Explain types of serial data transmission.
18. Discuss time division multiplexing technique.
19. Discuss frequency division multiplexing technique.
20. Describe hybrid switching technique.
21. What is logic link control in IEEE standard?
22. Write short note on internet.
23. Write short note on LAN protocol.
24. Write short note on local loopback address.
25. What are the UDP applications?
26. What is an IP Address?
27. Differentiate between IPv4 and IPv6.
28. Draw neat labeled diagram of header format of IP address, explain each block in brief.
29. Write short note on header format of TCP.

30. Differentiate between Class A, B, C of IP addresses.
31. Explain logical link control.
32. Enlist IEEE standards with their purpose.
33. Explain packet switching technique.
34. Write short note on serial data transmission. Explain asynchronous data transmission.
35. Explain software layers of OSI model.
36. Explain hardware layers of OSI model.
37. Write short note on broadcast network.
38. Write short note on Cut command of UNIX os.
39. Write short note on paste command of UNIX os.
40. What is pipe fitting?
41. Write short note on modes of VI editor.
42. Write short note on absolute and relative paths.
43. Explain types of variables.
44. Write short note on index node of os.
45. Write short note on twisted pair cable.

6 Marks.

1. Explain internal file structure of Unix os with neat labeled diagram.
2. Explain Input and output redirection in UNIX os with examples.
3. What is vi editor? How to use vi editor in unix os?
4. What is wildcard? Describe in brief different wildcards.
5. Define filters in UNIX? Explain some common filter commands in UNIX.
6. Explain each layer of Unix os in detail.
7. Explain internal commands of UNIX os.
8. Explain given commands Unique, more, tail, head, less, sort, grep.
9. Explain unguided transmission media in computer network.
10. Explain guided transmission media in computer network.
11. Explain different types of LAN network.
12. Describe LAN components of HUB, Switch, Router, Bridge, and Repeater?

13. Describe wide area network.
14. Explain MAN with neat diagram.
15. Explain types of LAN network.
16. Explain Wireless LAN network and their types.
17. Describe back bone structure.
18. Explain in brief OSI reference model?
19. Explain in detail switching techniques?
20. What is data transmission? Describe types of data transmission.
21. What is IEEE? And give list of IEEE standard and their purpose.
22. How to solve channel allocation problem.
23. Explain types of IP address.
24. Describe error control message in Ip protocol.
25. Explain UDP protocol.
26. Explain TCP protocol.
27. Describe Routing protocol.
28. What is LAN protocol?
29. Explain file system of UNIX os.
30. Explain IP protocol.