Seat No.	

ENT - 33

Total No. of Pages : 22

P. G. Re-Entrance Examination, 2025
M. Sc. ELECTRONICS
Subject Code: 58298

.....

Day and Date : Thursday, 10-07-2024 **Total Marks : 100**

Time : 1.00 p.m. to 2.30 p.m.

.....

Instructions :

1) All questions are compulsory
2) Each question carries 1 mark.
3) Answers should be marked in the given OMR answer sheet by darkening the appropriate option.
4) Follow the instructions given on OMR sheet.
5) Rough work shall be done on the sheet provided at the end of question paper.

.....

1. What happens to the total capacitance when capacitors are connected in series?

A) The total capacitance increases.

B) The total capacitance decreases.

C) The total capacitance remains the same.

D) The effect on total capacitance depends on the voltage rating

2. What is the primary function of a resistor in an electronic circuir?

A) To store electrical energy. B) To oppose the flow of current.

C) To amplify the voltage. D) To generate oscillations.

3. The Superposition Theorem is primarily used for analyzing:

A) Non-linear circuits

B) Circuits with dependent sources only

C) Linear circuits with two or more independent sources

D) Circuits with only one independent source

4. The color of light emitted by an LED depends primarily on.

A) The forward current through the LED.

B) The type of semiconductor material used and its doping.

C) The reverse voltage applied across the LED.

D) The size and shape of the LED package.

5. A Zener diode is primarily used in voltage regulator circuits to:

A) Amplify the input voltage.

B) Maintain a constant output voltage despite variations in input voltage or load current.

C) Rectify an AC input voltage.

D) Switch circuits on and off.

6. The hexadecimal equivalent of the binary number 101101 is:

A) 2D B) 2B

C) 3D D) 3B

7. An XOR (Exclusive OR) gate produces a HIGH output when:

A) Both imputs are HIGH B) Both inputs are LOW.

C) The inputs are different. D) The inputs are the same.

8. Simplify the Boolean expression A+A:

A) A B) 2A

C) 2 D) 1

9. A 4-to-1 multiplexer has:

A) 1 select line. B) 2 select lines,

C) 4 select lines. D) 6 select lines.

10. A demultiplexer is a combinational circuit that:

A) Selects one of several input signals and routes it to a single output.

B) Converts serial data to parallel data.

C) Routes a single input signal to one of several output lines.

D) Generates multiple output signals from multiple input signals.

11. In an NPN transistor, the majority charge carriers in the emitter are:

A) Holes B) Electrons

C) Positive ions D) Negative ions

12. For a BJT to operate in the active region, the base-emitter junction should be ..... biased and the huse collector junction should be ..... biased.

A) Reverse, Reverse B) Forward, Forward

C) Forward, Reverse D) Reverse, Forward

13. Impedance matching between cascaded amplifier stages is important to:

A) Increase the overall gain. B) Maximize power transfer.

C) Increase the bandwidth. D) Reduce distortion.

14. Positive feedback in an amplifier can lead to:

A) Increased stability. B) Decreased distortion.

C) Oscillations. D) Reduced noise.

15. A Wien bridge oscillator is primarily used for generating:

A) High-frequency sinusoidal waveforms.

B) Low-frequency sinusoidal waveforms.

C) Square wave waveforms.

D) Triangular wave waveforms.

16.What is the modulus of a 4-bit decade counter?

a) 4 b) 8

c) 10 d) 16

17. Which flip-flop is characterized by a race-around condition when both J and K inputs are high?

a) SR Flip-Flop b) D Flip-Flop

c) JK Flip-Flop d) T Flip-Flop

18. In a 4-bit binary weighted DAC, what determines the output voltage?

a) The reference voltage and resistor values

b) The clock frequency

c) The input frequency

d) The number of flip-flops

19. Which performance characteristic of a DAC refers to the smallest change in output voltage it can produce

a) Accuracy b) Resolution

c) Conversion time d) Linearity

20. Which ADC technique uses a counter to compare the input voltage with a reference voltage incrementally?

a) Dual Slope ADC b) Successive Approximation ADC

c) Flash ADC d) Sigma-Delta ADC

21. ..... is the noise temperature of the sun"

A. 100000 B. 8000

C. 100 D. 3000

22. ..... is equivalent to Henry.

A. Volts/Ampere B. Weber Ampere

C. Weber/Ampere2 D. None of these

23. ..... number of a career in a semiconductor.

A.2 B. 8

C.5 D. None of these

24. MICR stands for .....

A. Magnetic Ink Chart Receipt

B. Magnetic Ink Character Recognition

C. Magnetic Ink Chart Recognition

D. Magnetic Ink capacitor Reverse

25. one of the following semiconductor material?

A. copper B. silicon

C. tron D. None of these

26. In memory types, SDRAM stands for:

A) Static Dynamic Random Access Memory

B) Synchronous Dynamic Random Access Memory

C) Simple Dynamic Random Access Memory

D) Synchronous Direct RAM

27. When interfacing a 4 KB RAM with a microprocessor, how many address lines are needed"

A) 10 B) 11

C) 12 D) 13

28. How many flags are there in the 8085 flag register?

A) 3 B) 5

C) 7 D) 8

29. In 8085 the instruction MVI B, 32H uses which addressing mode?

A) Direct B) Immediate

C) Register D) Indirect

30. Which memory area in 8051 is bit-addressable?"

A) 00H 10 OFH B) 2011 t0 2FH

C) 30H to 7FH D) 80H to FFH

31. In Frequency Division Multiplexing (FDM), different signals are transmitted:

A) At different time slots

B) On different frequency bands

C) On the same frequency

D) Ou same time and same frequency

32. In sampling, if the sampling rate is less than twice the signal frequency, it leads to:

A) Quantization noise B) Aliasing

C) Phase distortion D) Carrier suppression

33. In mobile communication, BTS stands for:

A) Base Transmission System

B) Basic Telephone Station

C) Base Transceiver Station

D) Basic Terminal Setup

34. Quantization in PCM is the process of:

A) Taking continuous samples

B) Converting analog values to a finite number of levels

C) Encoding data using Huffman codes

D) Modulating the amplitude

35. GPS requires signals from how many satellites at minimurn for location detection?

A) 2 B) 3

C) 4 D) 5

36. In Immediate Addressing mode, the operand is:

A) A constant value that is used directly in the instruction

B) A memory address

C) A register address

D) A pointer to the data

37. The instruction "MOV A, #25H" is an example of which type of instruction?

A) Data Transfer B) Arithmetic

C) Logical D) Branch

38. What is the frequency of the clock that is being used as the clock source for the timer?

a) some externally applied frequency

b) controller's crystal frequency f

c) controller's crystal frequency/12

d) externally applied frequency/12

39. What should be done if we want to double the baud rate?

a) change a bit of the TMOD register

b) change a bit of the PCON register

c) change a bit of the SCON register

d) change a bit of the SBUF register

40. Which instruction is used to select the first row first column of an LCD?

a) 0x08 b) 0x0c

c) 0x80 d) 0xc0

41. An I VDT is mainly used to measure:

A) Temperature B) Pressure

C) Displacement D) Force

42. Shielding is primarily used to:

a) Reduce power consumption

b) Prevent the radiation or reception of electromagnetic interference

c) Improve the efficiency of power supplies

d) Protect components from physical damage

43. LVDT works on the principle of

A) Capacitance variation B) Mutual inductance

C) Piezoelectric effect D) Hall effect

44. In a strain gauge application, the Wheatstone bridge detects:

A) Voltage directly

B) Current directly

C) Change in resistance due to strain

D) Frequency change

45. A band-stop filter allows:

A) All frequencies to pass

B) Only a specific band of frequencies to pass

C) Blocks a specific band of frequencies

D) Blocks all frequencies

46. What is a key distinguishing feature of a "smart sensor" compared to a traditional sensor?

a) Lower cost

b) Direct interface with analog circuits

c) Integrated signal processing capabilities

d) Requirement for complex external circuitry

47. Hall effect sensors are commonly used for measuring:

a) Temperature

b) Pressure

c) Magnetic field strength, position, and current

d) Light intensity

48. The LM35 is an example of a an:

a) Thermocouple b) RTD

c) Thermistor d) Integrated circuit temperature sensor

49. The principle of operation of LVDT is based on the variation of

a) Self inductance b) Mutual inductance

c) Reluctance d) Permanence

50. Op-Amp as current to voltage converter is also called as

A. trans-impedance amplifier B. trans-conductance amplifier

C. inverting amplifier D. all of the above

51. What are the features of instrumentation amplifier?

a) Low noise b) High gain accuracy

c) Low thermal and time drift d) All of the mentioned

52. The knowledge of which parameter is sufficient for deriving the time varying electromagnetic field?

a. Electric field intensity b. Magnetic field intensity.

c. Current density d. Power density

53. Wavefront is basically a locus of points acquiring similar .....

a. Phase b. Frequency

c. Amplitude d. Wave equation

54. In which kind of waveform is the phase velocity defined?

a. Sinusoidal b. Rectangular

c. Square d. Triangular

55. Power density is basically termed as ..... power per unit arca

a. Reflected b. Refracted

c. Radiated d. Diffracted

56. Which ionization layer exists during day time & usually vanishes at night due to highest recombination rate?

a. D-region b. Nonnal E-region

c. Sporadic F-region d. Appleton region

57. ..... is the address of the interrupt vector for the External Interrupt 0 (INTO).

a) 0000H b) 0003H

c) 000BH d) 0013H

58. .....flags are associated with the serial communication interrupt in the 8051.

a) TFO and TE1 b) TRO and TR1

c) R1 and T1 d) RB8 and TBS

59. ..... are the two external hardware interrupt input pins in the 8051

a) P1.0 and P1.1 b) RXD and TXD

c) TO and T1 d) INTO and INTI

60. ..... port of 8051 is typically used as a general-purpose 10 port without any alternate functions upon reset.

a) Port 0 b) Port 1

c) Port 2 d) Port 3

61. ..... is crucial consideration, while interfacing oan Analog-to-Digital Converter (ADC) to the 8051 which of the following is a crucial consideration?

a) The clock frequency of the 8051.

b) The resolution and sampling rate of the ADC

c) The power supply voltage of the 8051.

d) The number of ports available on the 8051.

62. ..... is the primary purpose of a watchdog timer in a microcontroller system like the 8051

a) To measure the execution time of a program.

b) To generate precise time delays.

c) To detect and recover from software malfunctions or hardware glitches that cause the microcontroller to hang

d) To reduce the power consumption of the microcontroller.

63. What does PC stand for?

a) Inter-Integrated Circuit

b) Integrated Interface Controller

c) Inter-Communication Channel

d) Internal Circuit Connection

64. MOSI stand for in ..... SPI communication.

a) Master Out Slave In

b) Master Output Serial Input

c) Multiple Output Single Input

d) Main Operating System Interface

65. In a three-phase half-wave rectifier with resistive load, how many diodes conduct simultaneously?

a) One b) Two

c) Three d) Four

66. What is the effect of a large inductive load in a three-phase full-wave rectifier?

a) Increases ripple in output voltage

b) Smooths output current

c) Reduces output voltage

d) Increases power loss

67. In a controlled rectifier, what does the firing angle determine?

a) Output voltage magnitude b) Input frequency

c) Diode conduction time d) Reverse recovery time

68. What is the role of a freewheeling diode in a semi-converter circuit?

a) To increase output voltage

b) To provide a path for inductive load current

c) To reduce firing angle

d) To prevent reverse recovery

69. What is the primary function of a single-phase bidirectional controller with resistive load?

a) Voltage regulation

b) Power factor correction

c) ON/OFF control of AC power

d) Frequency modulation

70. Which application uses high-frequency switching to reduce transformer size?

a) UPS b) SMPS

c) Electronic ballast d) Power factor correction

71. What is the principle behind induction heating?

a) Resistive heating of conductive materials

b) Eddy current generation in conductive materials

c) Dielectric loss in insulators

d) Capacitive coupling

72. In power factor correction, what is the main goal?

a) To reduce harmonic distortion

b) To align voltage and current phases

c) To increase output voltage

d) To reduce switching losses

73. Which drive system is commonly used in industrial robots for precise motion"

a) Pneumatic drive b) Hydraulic drive

c) Electric drive d) Manual drive

74. Which type of robot control system uses feedback to adjust motion?

a) Non-servo control b) Servo control

c) Manual control d) Open-loop control

75. What is a key advantage of robotics in manufacturing?

a) Increased human error

b) Improved precision and efficiency

c) Higher operational costs

d) Reduced production speed

76. Which of the following is NOT one of Asimov's Laws of Robotics?

    a) A robot must obey humans

    b) A robot must not harm humans

    c) A robot must maximize profits

    d) A robot must protect its own existence

77. What is an advantage of a brushless permanent magnet DC motor?

    a) Requires frequent maintenance

    b) Higher efficiency and longer lifespan

    c) Lower torque output

    d) Complex control system

78. Which mechanical component is used to convert rotational motion to translational motion?

    a) Gear train b) Cam

    c) Ratchet and paw! d) Belt drive

79. Which component is central to a function generator using the 8038 IC?

    a) Voltage-controlled oscillator

    b) Microprocessor

    c) Digital-to-analog converter

    d) Spectrum analyzer

80. Which power electronic device is used for voltage regulation and reactive power compensation in power systems?

    a) Diode b) MOSFET

    c) IGBT d) SVC

81. Multimode step index fiber has .....

a) Large core diameter & large numerical aperture

b) Large core diameter and small numerical aperture

c) Small core diameter and large numerical aperture

d) Small core diameter & small numerical aperture

82. A typically structured glass multimode step index fiber shows as variation of attenuation in range of .....

a) 1.2 to 90 dB km at wavelength 0.69µm

b) 3.2 to 30 d3 km at wavelength 0.59um

c) 2.6 to 50 dB km at wavelength 0.85µm

d) 1.6 to 60 dB km at wavelength 0.90µm

83. Multimode step index fiber has a large core diameter of range is .....

a) 100 to 300 µm b) 100 to 300 nm

c) 200 to 500 µm d) 200 to 500 nm

84. Multimode graded index fibers are manufactured from materials with .....

a) Lower purity

b) Higher purity than multimode step index fibers.

c) No impurity

d) Impurity as same as multimode step index fibers.

85. The performance characteristics of multimode graded index fibers are.....

a) Better than multimode step index fibers

b) Same as multimode step index fibers

c) Lesser than multimode step index fibers

d) Negligible

86. Multimode graded index fibers with wavelength of 0.85um have numerical aperture of 0.29 have core cladding diameter of .....

a) 62.5 µm/125 µm b) 100 µm/140 µm

c) 85 µm/125 µm d) 50 µm/125um

87. ..... memory of PIC18 microcontrollers stores variable data during program execution.

a) Flash ROM b) EEPROM

c) SRAM d) Program Memory

88. ..... instruction is used to load an immediate value into the Working Register (WREG) in PIC18 assembly.

a) MOVF b) MOVWF

c) MOVLW d) ADDWF

89. In PIC18, GOTO instruction

a) Calls a subroutine.

b) Returns from a subroutine.

c) Performs a conditional branch.

d) Performs an unconditional jump to a specified address,

90. In the PIC18, the primary function of the Peripheral Interrupt Enable (PIE) registers is to .....

a) To set the priority of peripheral interrupts.

b) To globally enable or disable all peripheral interrupts

c) To enable or disable individual peripheral interrupt sources.

d) To clear the flags of peripheral interrupts

91. PIC18 include a Master Synchronous Serial Port (MSSP) module, which operates in .....

    a) Only SPI mode.

    b) Only FC mode,

    c) Roth SPI and PC modes.

    d) Neither SPI nor PC modes.

92. PIC 18 timer can be configured as an 8-bit or 16-bit timer/counter.

    a) Timer b) Timerl

    c) Timer2 d) All of the above

93. The maximum sampling rate of the ADC in a PIC18 microcontroller is dependent on.....

    a) The number of analog input channels selected.

    b) The ADC clock frequency and the total conversion time per sample.

    c) The voltage reference used.

    d) The data justification format.

94. In an open-loop control system, the output has effect on the control action.

    a) a direct and significant b) no

    c) an indirect but considerable d) a proportional

95. In a closed-loop system, the control action is dependent on.....

    a) The input signal only.

    b) The output signal only.

    c) Both the input and the output signals,

    d) Neither the input nor the output signals.

96. ..... is a key advantage of a closed-loop control system.

a) Lower cost compared to an open-loop system.

b) Simpler design and implementation.

c) Higher accuracy and robustness to disturbances.

d) Faster response time in all situations.

97. PLC input modules are used to connect the PLC to .....

a) Actuators like motors and solenoids.

b) Sensors and switches that provide signals.

c) Other PLCs or control systems.

d) The power source.

98. Compared to hard-wired relay control systems, PLC's offer advantages such as .....

a) Increased complexity for simple tasks

b) Higher susceptibility to electrical noise.

c) Greater flexibility in modifying control logic.

d) Lower reliability in harsh industrial environments.

99. In Ladder Logic, a "rung" is .....

a) A physical wire connecting input and output devices.

b) A horizontal line representing a logical control circuit.

c) A vertical line representing the power rail,

d) A programming instruction for complex calculations.

100. In Ladder Logic, timers are used for .....

a) Performing mathematical calculations

b) Counting the number of input pulses.

c) Providing time delays in control sequences

d) Storing numerical data.

❐❐❐

Rough

Rough