MIZORAM PUBLIC SERVICE COMMISSION

COMMON COMPETITIVE EXAMINATION FOR GROUP 'B' NON-GAZETTED (TECHNICAL)

JUNIOR ENGINEER (CONTRACT BASIS) (ELECTRICAL) UNDER POWER & ELECTRICITY DEPARTMENT, GOVERNMENT OF MIZORAM, NOVEMBER-2024

PAPER-III (ELECTRONICS ENGINEERING)

Time Allowed : 2 hours FM : 200

All questions carry equal mark of 2 each.
Attempt all questions.

1. An Emitter is generally called –
(a) Anode (b) Cathode
(c) Grid (d) Drain

2. The process of conversion of AC to DC is called –
(a) Amplification (b) Modulation
(c) Rectification (d) Confirmation

3. What is the approximate voltage drop across a silicon diode when it is in forward bias?
(a) 0.2 V (b) 0.3 V
(c) 0.7 V (d) 1.5 V

4. In bridge rectifier we use –
(a) 1 diode (b) 2 diode
(c) 3 diode (d) 4 diode

5. The common-emitter transistor circuit has –
(a) High gain (b) Low gain
(c) Negligible gain (d) Zero gain

6. A PN junction behaves like a –
(a) Triode (b) Resistor
(c) Diode (d) Transistor

7. When a high reverse voltage is applied to a diode –
(a) Zener breakdown occurs (b) Avalance breakdown occurs
(c) It becomes Resistor (d) Cannot apply high reverse Voltage

8. An a.c. voltage of peak value 20 V is connected in series with a silicon diode and load resistance of 500 Ω. If the forward resistance of diode is 10 Ω, what will be the peak output voltage if it is an ideal diode.
(a) 20 V (b) 10 V
(c) 30 V (d) 18.9 V

9. In a npn transistor the minority carriers are –
   (a) free electrons
   (b) holes
   (c) donor ions
   (d) acceptor ions

10. For a BJT to operate in the active region –
   (a) the base-emitter junction should be forward-biased and the base-collector junction should be reverse-biased
   (b) the base-emitter junction should be reversed-biased and the base-collector junction should be reverse-biased
   (c) the base-emitter junction should be reversed-biased and the base-collector junction should be forward-biased
   (d) the base-emitter junction should be forward - biased and the base-collector junction should be forward-biased

11. The current equation is given by –
   (a) $I_E = I_B + I_C$
   (b) $I_E = I_B - I_C$
   (c) $I_B = I_E + I_C$
   (d) $I_C = I_E + I_B$

12. The full form of FET is –
   (a) Full economy tranisitor
   (b) Full emitter transistor
   (c) Field effect transistor
   (d) Field emitter transistor

13. The three terminal of MOSFET are –
   (a) Base, emitter and collector
   (b) Source, gate and drain
   (c) B_1, B_2 and Emitter
   (d) Cathode, Anode and Electrode

14. FET are classified into two type they are –
   (a) 3 terminal FET and 2 terminal FET
   (b) Drain less and Source less
   (c) Power FET and Non Power FET
   (d) Majority carrier and minority carrier

15. When there is no voltage across gate terminal the channel show maximum conductance, this type of FET is called –
   (a) Depletion mode
   (b) Enhancement mode
   (c) Amplification mode
   (d) Feedback mode

16. An amplifier has a gain of 20 without feedback. If 10% of the output is fedback by means of a resistance negative feedback circuit, the overall gain will be –
   (a) 16.55
   (b) 19.80
   (c) 10.85
   (d) 6.67

17. In SCR, If the anode is made positive with respect to cathode and gate terminal keep open, this mode of operation is called –
   (a) Forward blocking mode
   (b) Forward conduction mode
   (c) Reverse blocking mode
   (d) Reverse conduction mode

18. Which of the following amplifier has the highest efficiency –
   (a) Class A
   (b) Class B
   (c) Class C
   (d) Class D

19. _____ are electronic devices that generate various type of electrical waveform sine wave, square wave, triangle wave etc.
   (a) Function generator
   (b) Multimeter generator
   (c) Current generator
   (d) Ohm meter

20. A certain D-MOSFET is biased at VGS = 0V. Its data sheet specifies IDSS = 20mA and VGS(off) = – 5V. The value of the drain current is –

(a) 20 mA (b) 0 mA

(c) 40 mA (d) 10 mA

21. In a TRIAC circuit, the holding current is 50 mA. What happens if the current through the TRIAC falls below this value?

(a) The TRIAC turns off (b) The TRIAC remains on

(c) The TRIAC oscillates (d) The TRIAC gets damaged

22. Which of the following transistor can be used in enhancement mode?

(a) UJT (b) JFET

(c) MOSFET (d) NPN transistor

23. The full form of SCR is –

(a) Self Control Resistor (b) Silicon Controlled Rectifier

(c) Simulated Controlled Rectifier (d) Sufficient Contain Resistance

24. Which circuit is used to generate a sawtooth wave?

(a) Integrator (b) Differentiator

(c) Ramp generator (d) Astable multivibrator

25. The most common Opto electronics devices that is used in our TV remote control is –

(a) Resistor (b) Transistorised LED

(c) Infrared LED (d) White color LED

26. The potential barrier across PN junction correspond to –

(a) Height of barrier (b) Width of barrier

(c) Forward bias of the junction (d) Reverse bias of the junction

27. A crowbar circuit in SCR is used for –

(a) Over current protection (b) Over voltage protection

(c) Over rectification protection (d) Un rectification protection

28. If optical radiation is converted into electrical signal the devices is called –

(a) LED (b) Laser diode

(c) Photo diode (d) Dual diode

29. The full form of LASER is –

(a) Light and sun emission radiation

(b) Light amplifier sun eraser

(c) Light amplification by sun eraser and emission radiation

(d) Light amplification by stimulated emission of radiation

30.  The picture is the symbol for –

(a) LED (b) Zener diode

(c) Photo diode (d) Dual diode

31. What is the base of the binary number system?

(a) 8 (b) 10

(c) 12 (d) 2

32. How many digits in binary notation are required for dicimal number 17?

(a) 4 (b) 5

(c) 6 (d) 7

33. Number 85 in BCD code is –

(a) 1000-0001 (b) 1000-0101

(c) 1101-1101 (d) 0101-1100

34. The binary number 10101 in decimal is –

(a) 20 (b) 21

(c) 30 (d) 31

35. Which Addition is correct?

(a) 0101 + 1111 = 11010 (b) 0101 + 1111 = 10100

(c) 0101 + 1111 = 11001 (d) 0101 + 1111 = 11110

36. Logic table below gives the output for input A and B. The logic operation performed is –

A	B	C
0	0	1
0	1	0
1	0	0
1	1	1

(a) Negative *NOR* (b) Ex. *OR*

(c) NAN (d) Negative of Ex. *OR*

37. Which combinational circuit converts binary to decimal?

(a) Encoder (b) Decoder

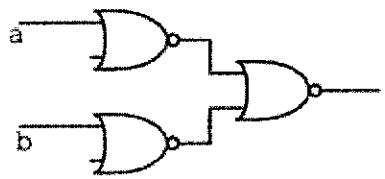
(c) Multiplexer (d) Demultiplexer

38. A *NAND* circuit with positive logic will operate as –

(a) *NOR* with negative logic (b) *AND* with negative logic

(c) *OR* With negative logic input (d) *AND* with negative logic output

39. The logic performed by the circuit shown below is –



(a) NAND (b) AND

(c) Ex. OR (d) Ex. AND

40. The most widely used universal gates are –

(a) *OR* and *AND* gates (b) *NOR* and *NAND* gates

(c) *NOR* and *AND* gates (d) *NAND* and *OR* gates

41. What is the state of a D flip-flop after a reset?

(a) Unknown (b) 1

(c) Previous state (d) 0

42. In a full adder, there are –

(a) Two binary number inputs and two outputs
(b) Three binary digit inputs and two binary outputs
(c) Three binary digit inputs and three binary digit outputs
(d) Two binary digit input and three binary outputs

43. Which of the following circuits can be used as a parallel-to-serial converter?

(a) Digital counter
(b) Decoder
(c) De-multiplexer
(d) Multiplexer

44. Which of the following circuits exhibits memory?

(a) Astablemultivibrator
(b) BistableMultivibrator
(c) *NAND* gates
(d) Ex. OR gate

45. Programmable logic array (PLA) uses –

(a) ROM Matrices
(b) PROM Matrices
(c) RAM Matrices
(d) Silo Memory

46. 8085 Microprocessor has how many pins?

(a) 20
(b) 30
(c) 40
(d) 50

47. The cycle required to fetch and execute an instruction in a 8085 microprocessor is which one of the following?

(a) Clock cycle
(b) Memory cycle
(c) Machine cycle
(d) Instruction cycle

48. The language that a computer can understand and execute is called –

(a) Application software
(b) Keyboard
(c) C – language
(d) Machine language

49. Which interrupts has highest Priority?

(a) INTR
(b) TRAP
(c) RST 7.5
(d) RST6.5

50. Which of the following is a one-byte instruction?

(a) MVI B, 05
(b) LDA 2500H
(c) IN 01
(d) MOV A,B

51. The op-amp has _____ open loop gain.

(a) 0
(b) 1
(c) Infinite
(d) Finite

52. When amplifier has only one input the amplified output is given by –

(a) $A_v = V_{in} / V_{out}$
(b) $Av = V_{out} / V_{in}$
(c) $A_v = V_{in} / V_{in}$
(d) $A_v = V_{out} / V_{out}$

53. In the Op-amp configuration the voltage which add or subtract the input voltages are called –

(a) Differential amplifier
(b) Cascade amplifier
(c) Summing amplifier
(d) Coupled amplifier

54. A Dual-In-Line Package is usually referred to as –

(a) DIPs
(b) nDIP
(c) DILP
(d) DIP

55. The other name for Miller Circuit is –

(a) Non-Inverting Integrator
(b) Inverting Integrator
(c) Non-Inverting Differentiator
(d) Inverting Differentiator

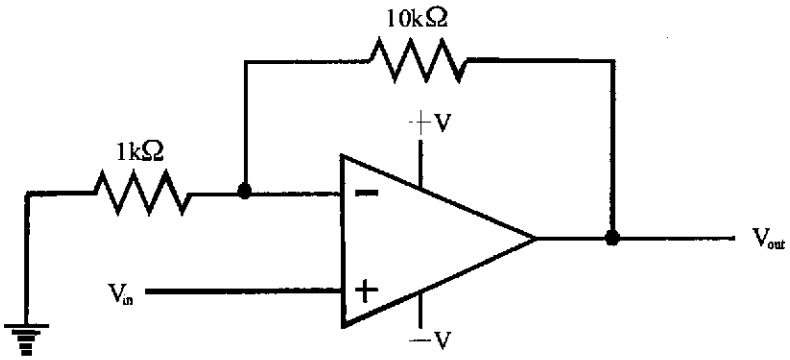
56. In IC-741 op-amp we used _____ power supply.

(a) Single
(b) Dual
(c) Triple
(d) AC

57. OP-Amp can be used as _____ amplifier to provide a stable, linear relationship between input and output.

(a) Inverting
(b) Non-Inverting
(c) Adder
(d) Differentiator

58. For the given circuit find the output voltage for an an input voltage of –1V?



(a) -11 V
(b) 11 V
(c) 10 V
(d) -10 V

59. What is the function of low pass filter in phase-locked loop?

(a) Improves low frequency noise
(b) Removes high frequency noise
(c) Tracks the voltage change
(d) Changes the input frequency

60. The flash type A/D converters are called as –

(a) Parallel non-inverting A/D converter
(b) Parallel counter A/D converter
(c) Parallel inverting A/D converter
(d) Parallel comparator A/D converter

61. PLL is used in –

(a) Motor speed control
(b) Voltage rectifier
(c) Sound Amplifier
(d) Integrator

62. Analog to digital converter are employed in –

(a) Ammeter
(b) Voltmeter
(c) Ohm meter
(d) Digital multimeter

63. The fastest type of analog to digital converter is –

(a) Counter type
(b) Tracking type
(c) Successive approximation type
(d) Parallel comparator type

64. How many control lines are present in analog to digital converter in addition to reference voltage?

(a) Three
(b) Two
(c) One
(d) None

65. What type of integration is chosen to fabricate Integrated Circuits like Counters, multiplexers and Adders?

(a) Small Scale Integration (SSI) (b) Medium Scale Integration (MSI)
(c) Large Scale Integration (LSI) (d) Very Large Scale Integration (VLSI)

66. The smallest change in the input signal that can be detected by an instrument is called –

(a) Accuracy (b) Sensitivity
(c) Resolution (d) Precision

67. The full form of IC is –

(a) Integral Circuit (b) Integrated Circuit
(c) Information Circuit (d) Initial Circuit

68. The full form of VLSI is –

(a) Very light system information (b) Very large system information
(c) Very long story information (d) Very large scale integration

69. The resolution of 4-bit counting ADC is 05V for analog input of 5.8V the output of ADC will be –

(a) 1100 (b) 1101
(c) 1111 (d) 1011

70. In communication circuit, PLL is currently applicable for –

(a) Modulation application (b) Demodulation application
(c) Rectification application (d) Encoder application

71. 8051 series has how many 16 bit register?

(a) 0 (b) 1
(c) 2 (d) 3

72. When the microcontroller executes some arithmetic operations, then the flag bits of which register are affected?

(a) PSW (b) SP
(c) DPTR (d) PC

73. How are the status of the carry, auxiliary carry and parity flag affected if the write instruction

MOV A,#9C
ADD A,#64H

(a) CY=0,AC=0,P=0 (b) CY=1,AC=1,P=0
(c) CY=0,AC=1,P=0 (d) CY=1,AC=1,P=1

74. On power up, the 8051 uses which RAM location for register R0 – R7

(a) 00-2F (b) 00-7F
(c) 00-07 (d) 00-02

75. What is the meaning of the instruction MOV A,05H?

(a) data 05H is stored in the accumulator (b) fifth bit of accumulator is set to one
(c) address 05H is stored in the accumulator (d) data 05H is rotated

76. What is the size of the program counter in the 8051 microcontroller?

(a) 8 bits (b) 10 bits
(c) 11 bits (d) 16 bits

77. How many registers can be utilized to write the programs by an effective selection of register bank in program status word (PSW)?
(a) 8 (b) 16
(c) 32 (d) 64

78. Which of the ports act as the 16 bit address lines for transferring data through it?
(a) PORT 0 and PORT 1 (b) PORT 1 and PORT 2
(c) PORT 0 and PORT 2 (d) PORT 1 and PORT 3

79. When we add two numbers in 8051 the destination address must always be a/an –
(a) some immediate data (b) any register
(c) accumulator (d) memory

80. Which among the single operand instructions complement the accumulator without affecting any of the flags?
(a) CLR (b) SETB
(c) CPL (d) APC

81. Which instruction should be adopted for moving an accumulator to the register from the below mentioned mnemonics?
(a) MOV A, R_n (b) MOV A, @ R_i
(c) MOV R_n, A (d) MOV direct, A

82. How many SFR (Special Function Register) are there in 8051 microcontroller?
(a) 21 (b) 12
(c) 16 (d) 8

83. Which location specify the storage/loading of vector address during the interrupt generation?
(a) Stag pointer (b) Program counter
(c) Data pointer (d) Data counter

84. What is the bit addressing range of addressable individual bits over the on-chip RAM?
(a) 00H - FFH (b) 01H – 7FH
(c) 00H – 7FH (d) 80H - FFH

85. Which pin of the external hardware is said to exhibit INT0 interrupt?
(a) pin no 10 (b) pin no 11
(c) Pin no 12 (d) pin no 13

86. What is the uses of capacitor in rectifier?
(a) To block AC current (b) To minimize ripple content
(c) To increase voltage output (d) To block DC current

87. If the frequency of 50Hz is supply to full wave rectifier, What will be the output frequency?
(a) 25Hz (b) 50Hz
(c) 75Hz (d) 100Hz

88. The phase shift of oscillator is –
(a) 45° (b) 90°
(c) 180° (d) 360°

89. If 50Hz sine wave is converted into square wave, what will be the square wave frequency?
(a) 50Hz (b) 60Hz
(c) 100Hz (d) 150Hz

90. What will be the backup time of a UPS if it is backed by a 150 Ah, 12V battery driving a load of 150W?
(a) 14 hour (b) 10 hour
(c) 12 hour (d) 16 hour

91. The phase difference between the output and input voltages of a CE amplifier is –
(a) 180 degree (b) 90 degree
(c) 270 degree (d) in phase

92. When amplifier are cascaded –
(a) the overall gain is increased (b) The gain of each amplifier is decreased
(c) each amplifier has to work less (d) a lower supply voltage is required

93. Which of the following signals are generated by Wien-bridge oscillators?
(a) Square wave (b) Sine wave
(c) Triangular wave (d) Pulse wave

94. In RC phase shift oscillator, one R-C bridge provides _____ phase shift.
(a) 30° (b) 60°
(c) 90° (d) 180°

95. The machine which transform one form of energy to another form is called –
(a) Transformer (b) Transponder
(c) Transducer (d) Transcontinental

96. Which of the following is used in logical output that can switch hydraulic or pneumatic switch?
(a) Light (b) Motor starter
(c) AC motor (d) Solenoid valve

97. The full range of audibility in audio frequency oscillator is –
(a) 0 to 20 Hz (b) 20 Hz to 2 kHz
(c) 20 Hz to 20 kHz (d) 20 Hz to 20 MHz

98. What is the primary function of a high voltage driver?
(a) To convert AC to DC
(b) To reduce current
(c) To provide high voltage output to power devices
(d) To filter noise from a signal

99. What type of device is often used to drive high voltage applications in power electronics?
(a) Operational Amplifier (b) MOSFET
(c) Diode (d) Rectifier

100. Buffer amplifier needs to have –
(a) Low input resistance and low output resistance
(b) High input resistance and high output resistance
(c) Low input resistance and high output resistance
(d) High input resistance and low output resistance

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