

MIZORAM PUBLIC SERVICE COMMISSION
TECHNICAL COMPETITIVE EXAMINATIONS FOR RECRUITMENT TO THE POST OF
GRADE-V OF MIZORAM ENGINEERING SERVICE (AE/SDO)
UNDER POWER & ELECTRICITY DEPARTMENT, GOVERNMENT OF MIZORAM
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ELECTRONICS ENGINEERING
PAPER – II

Time Allowed : 3 hours

Full Marks : 200

All questions carry equal marks of 1 each.
Attempt all questions.

1. The maximum theoretical efficiency for class A amplifier is
(a) 12.5% (b) 25 %
(c) 50% (d) 75%
2. If it is desired to have low output impedance in an amplifier circuit then we should use
(a) common collector circuit (b) common base circuit
(c) common emitter circuit (d) either (b) or (c)
3. Which amplifier has the highest power gain?
(a) common collector (b) common base
(c) common emitter (d) both CC and CE
4. Which amplifier has a voltage gain of less than unity?
(a) common base (b) common collector
(c) common emitter (d) both CB and CC
5. For class B operation the theoretical maximum efficiency is
(a) 100% (b) 78.5%
(c) 50% (d) 27.5%
6. A push pull amplifier is a
(a) power amplifier (b) voltage amplifier
(c) current amplifier (d) both (a) and (c)
7. If the mid band gain of an amplifier is 40dB, the gain at half power frequency is
(a) 37dB (b) 30dB
(c) 20dB (d) 13dB
8. The purpose of impedance matching in an amplifier circuit is to achieve
(a) high frequency (b) reduced distortion
(c) maximum power transfer (d) none of these

9. A transistor amplifier is operating in class A mode. If a transformer is connected for impedance matching, the efficiency will
- (a) increase (b) decrease
(c) not affected (d) may increase or decrease
10. At mid band frequencies the coupling capacitor of an RC coupled CE amplifier may be considered as
- (a) open circuit (b) short circuit
(c) an inductance (d) none of these
11. Which of the following amplifier circuits have highest input impedance?
- (a) circuit using BJT (b) circuit using JFET
(c) circuit using MOSFET (d) either (a) or (b)
12. The open loop gain of an amplifier is 200. If negative feedback with $\beta=0.2$ is used, the closed loop gain will be
- (a) 200 (b) 40.12
(c) 4.878 (d) 2.2
13. The open loop gain of an amplifier is 50 but is likely to decrease by 20% due to various factors. If negative feedback with $\beta=0.1$ is used the change in gain will be about
- (a) 20% (b) 10%
(c) 3.33% (d) 0.5%
14. The input to an Op-Amp integrating amplifier is constant voltage. The output will be a
- (a) constant voltage (b) saw tooth wave
(c) ramp voltage (d) any ac wave
15. The element in the feedback circuit of a logarithmic amplifier using Op-Amp is a
- (a) resistor (b) capacitor
(c) inductor (d) diode
16. As compared to full wave rectifier, a half wave rectifier has
- (a) higher ripple factor (b) lower ripple factor
(c) same ripple factor (d) none of these
17. A rectifier circuit has load resistance R and uses a capacitor filter having capacitance C. For low ripple in the output, the value of RC should be
- (a) one (b) low
(c) high (d) neither low nor high
18. A Hartley oscillator uses
- (a) tapped inductor (b) tapped capacitor
(c) both (a) and (b) (d) neither (a) nor (b)

200. Which of the following is not a library string function in C?
- (a) strlen (b) strcpy
(c) strdup (d) strbig

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189. The 8257 chip is a
(a) Programmable interrupt controller (b) programmable peripheral interface
(c) Programmable DMA controller (d) programmable interval Timer
190. Which of the following 8085 instruction does not belong to arithmetic group?
(a) SHLD (b) SUI
(c) ADC (d) INR
191. In which group of instructions condition flags are not affected?
(a) data transfer group (b) arithmetic group
(c) logical group (d) both (a) & (c)
192. The register set and instruction set of 8088 processor is similar to that of
(a) 8085 (b) 8086
(c) 8087 (d) none of these
193. Which of the following instructions have only one operand?
(a) add (b) multiply
(c) subtract (d) shift
194. Which of the following identifiers is invalid in PASCAL?
(a) Beta (b) MAX40
(c) 2.Nd (d) A Max
195. Which of the following is not a valid real constant in C?
(a) 426 (b) 321.0
(c) - 627.431 (d) + 201.84
196. The maximum number of characters for variable name in C language is
(a) 4 (b) 8
(c) 12 (d) 16
197. What does the operator () mean in C?
(a) function expression (b) array expression
(c) structure operator (d) increment/decrement
198. The statement !(b < 5) in C means
(a) B = 5 (b) b > 5
(c) b >= 5 (d) b <= 5
199. The number of storage classes in C is
(a) 2 (b) 3
(c) 4 (d) 6

19. A potential of 7V is applied to a silicon diode in series with a 1KΩ load resistor. If the diode is forward biased, then the current in the circuit is
(a) 7mA (b) 6.3mA
(c) 0.7mA (d) zero
20. If input frequency is 50Hz, the frequency of output wave in a full wave diode rectifier circuit is
(a) 25Hz (b) 50Hz
(c) 100Hz (d) 200Hz
21. The dc load current in a bridge rectifier circuit is 10mA. The dc load current through each diode is
(a) 40mA (b) 20mA
(c) 10mA (d) 5mA
22. In a bridge rectifier circuit the r.m.s. value of input ac voltage is 10V. The PIV across each diode is
(a) 7.07V (b) 10V
(c) 14.14V (d) 28.28V
23. In a self bias circuit for CE amplifier, the base voltage is
(a) equal to supply voltage (b) more than supply voltage
(c) less than supply voltage (d) none of these
24. The self bias provides
(a) stable Q point (b) large voltage gain
(c) high input impedance (d) high base current
25. For dc the current through coupling capacitor in CE amplifier circuit is
(a) very high (b) high
(c) low (d) zero
26. A bypass capacitor produces
(a) dc ground (b) ac ground
(c) both (a) & (b) (d) none of these
27. In deriving ac equivalent circuit for an amplifier circuit we short circuit all
(a) resistors (b) inductors
(c) transistors (d) capacitors
28. When the ac base voltage in a CE amplifier circuit is too high, the ac emitter current is
(a) zero (b) constant
(c) alternating (d) distorted
29. In a CE amplifier circuit, the output voltage
(a) is very small (b) depends on β
(c) is always constant (d) none of these

30. In a two stage CE amplifier circuit, the collector resistance of the first stage depends on
(a) load resistance (b) input impedance of first stage
(c) input impedance of 2nd stage (d) all of the above
31. In a CE amplifier circuit the emitter bypass capacitor is removed. The ac output voltage
(a) increases (b) remains same
(c) decreases (d) increase or decreases
32. The purpose of connecting a coupling capacitor in the output circuit of an amplifier is
(a) to increase voltage gain (b) to increase collector current
(c) to block dc collector voltage (d) all of these
33. A class A transformer coupled power amplifier is to deliver 10W output. The power rating of transistor should not be less than
(a) 5W (b) 10W
(c) 20W (d) 40W
34. In a differential amplifier, CMRR can be improved by using an increased
(a) emitter resistance (b) collector resistance
(c) power supply voltage (d) source resistance
35. Crossover distortion behaviour is a characteristic of
(a) Class A (b) Class B
(c) Class AB (d) Class C
36. Negative feedback in amplifier
(a) reduces gain (b) increases frequency and phase distortion
(c) reduces bandwidth (d) increases noise
37. The early effect in BJT is caused by
(a) fast turn on (b) fast turn off
(c) large collector base reverse bias (d) large emitter base forward bias
38. If the Q of a single stage, single tuned amplifier is doubled, the bandwidth will be
(a) same (b) halved
(c) doubled (d) quadrupled
39. In every practical oscillator the loop gain is slightly more than unity and amplitude of oscillations is limited by
(a) magnitude of loop gain (b) onset of non linearity
(c) magnitude of gain (d) feedback factor
40. In an Op-Amp comparator, the positive or negative output is
(a) saturated (b) amplified
(c) un-saturated (d) any of the above

178. Which of the following directives in 8085 assembler causes 2 bytes to be reserved in the memory?
(a) DS (b) DB
(c) DW (d) EQU
179. Which of the following is not treated as hexadecimal constant by 8085 assembler?
(a) 234 (b) 64QH
(c) A?P0H (d) all of above
180. To multiply a number by 8 in 8085 processor, we have to use RAL instruction
(a) once (b) twice
(c) thrice (d) four times
181. Which instructions are useful for writing subroutines?
(a) CALL (b) RET
(c) both (a) & (b) (d) none of these
182. Which of the following memories is the fastest?
(a) cache (b) primary
(c) secondary (d) backup
183. Most of the memory chips with static RAM need
(a) 2V supply (b) 5V supply
(c) 12V supply (d) none of above
184. The number of interrupt lines in 8085 processor is
(a) 2 (b) 3
(c) 4 (d) 5
185. Which of the following is not an interrupt line in 8085?
(a) RST5.5 (b) RST7.5
(c) RST9.5 (d) TRAP
186. In 8085 processor, the address space size is
(a) 64 Kbits (b) 64 Kbytes
(c) 32 Kbits (d) 32 Kbytes
187. 8255A is a
(a) PPI (b) I/O device
(c) memory (d) none of above
188. Which of the following is also called hand shaking programmed data transfer?
(a) synchronous data transfer (b) asynchronous data transfer
(c) interrupt driven data transfer (d) both (a) & (c)

167. In 8085 the pins for + 5V input and ground are
(a) 20 & 40 (b) 40 & 20
(c) 1 & 2 (d) 2 & 1 respectively
168. ALE stands for
(a) Address latch enable (b) accumulator latch enter
(c) address latch enter (d) accumulator latch enable
169. If 8085 processor is required to add two 32 bit numbers, the numbers of addition sequence is
(a) 1 (b) 2
(c) 4 (d) 8
170. In Intel 8085, the integer range per word length is
(a) - 128 to 127 (b) - 127 to 128
(c) - 64 to 63 (d) - 63 to 64
171. Which of the following schemes has unique representation of zero?
(a) Sign magnitude (b) 1's complement
(c) 2's complement (d) both (b) & (c)
172. The decimal equivalent of binary (1101.11) is
(a) 9.75 (b) 11.50
(c) 11.75 (d) 13.75
173. 6 bytes means
(a) 6 bits (b) 24 bits
(c) 48 bits (d) 96 bits
174. In 8085 stack pointer is
(a) 4 bit (b) 8 bit
(c) 16 bit (d) 32 bit
175. The 8085 instruction LDA 0FFAH is an example of
(a) direct addressing (b) register addressing
(c) immediate addressing (d) implicit addressing
176. In 8085, which addressing mode is also called inherent addressing?
(a) direct (b) register
(c) implicit (d) immediate
177. Length of an instruction of 8085 processor, using immediate addressing mode is
(a) 2 bytes (b) 3 bytes
(c) 2 or 3 bytes (d) 4 bytes

41. In an RC phase shift oscillator, the total phase shift of the three RC lead network is
(a) 360° (b) 180°
(c) 90° (d) 0°
42. An OP-Amp uses
(a) RC coupling (b) direct coupling
(c) transformer coupling (d) either (b) or (c)
43. Which of the following is difficult to be fabricated in a monolithic IC?
(a) inductors (b) large capacitors
(c) small capacitors (d) both (a) and (b)
44. FET can be used in
(a) buffer amplifier circuits (b) cascade amplifier circuits
(c) digital circuits (d) all of the above circuits
45. In a class C power amplifier the input frequency of ac signal is 1MHz. If tank circuit has $C=1000\text{pF}$, the value of L is
(a) 25 μH (b) 50 μH
(c) 100 μH (d) 200 μH
46. If the output current wave shape of class C circuit has a period 1 μsec and pulse width of 0.006 μsec , the duty cycle is
(a) 6% (b) 0.6%
(c) 0.06% (d) 0.006%
47. Transformer coupling is mostly used in
(a) RF amplifier (b) audio amplifier
(c) both (a) and (b) (d) None of these
48. In a CE amplifier the ac cut-off voltage is 9V and slope of ac load line is -0.5mA/V , the ac saturation current is
(a) 18mA (b) 9mA
(c) 4.5mA (d) 3mA
49. A CB amplifier has $r_e=6\Omega$, $R_L=600\Omega$ and $\alpha=0.98$. The voltage gain is
(a) 88 (b) 100
(c) 98 (d) 6
50. The disadvantage of direct coupled amplifier is
(a) Drift (b) large size of BJT
(c) low voltage gain (d) both (b) and (c)
51. A CE amplifier has $r_e=6\Omega$, $\beta=100$. The input impedance is
(a) 6 Ω (b) 98 Ω
(c) 100 Ω (d) 600 Ω

52. The most commonly used bias in BJT amplifier circuit is
(a) voltage divider bias (b) emitter bias
(c) collector bias (d) collector feedback bias
53. In a commercially available good power supply the voltage regulation is about
(a) 1% (b) 5%
(c) 10% (d) 20%
54. A voltage doubler circuit uses
(a) two diodes (b) two capacitors
(c) two diodes and two capacitors (d) none of these
55. Slew rate of an ideal OP-Amp is
(a) zero (b) $1V/\mu s$
(c) $10V/\mu s$ (d) ∞
56. If an OP-Amp has unity gain frequency of 1MHz, the cut off frequency at gain 10 will be
(a) 100KHz (b) 1MHz
(c) 10MHz (d) 90MHz
57. A Darlington pair is used for
(a) low distortion (b) high bandwidth
(c) high power gain (d) high current gain
58. An ideal OP-Amp has
(a) infinite input and output impedance (b) low input and output impedance
(c) low input and high output impedance (d) infinite input and zero output impedance
59. Which of the following OP-Amp circuits has zero resistance in the feedback path?
(a) inverting amplifier (b) non-inverting amplifier
(c) source follower (d) summing amplifier
60. An OP-Amp has zero gain for common mode inputs. The CMRR is
(a) zero (b) high
(c) infinite (d) low
61. Which OP-Amp circuit uses a resistance in series with input and capacitor in feedback path?
(a) differentiating amplifier (b) integrator
(c) logarithmic amplifier (d) exponential amplifier
62. In which of the following circuit is OP-Amp used in open loop configuration?
(a) comparator (b) Summing amplifier
(c) Integrator (d) multiplier
63. In which amplifier circuit is gate conductance negligible?
(a) JFET (b) MOSFET
(c) Both (a) and (b) (d) None of these

156. The radius of constant N circle for $N = 1$ is
(a) $\sqrt{2}$ (b) 2
(c) 1 (d) $1/\sqrt{2}$
157. The polar plot of a transfer function passes through $(-1, 0)$ point. The gain margin is
(a) Zero (b) -1 dB
(c) 1 dB (d) ∞
158. The force required to initiate motion between two contacting surfaces is called
(a) Coulomb force (b) viscous force
(c) stiction (d) none of these
159. Generally a servo motor operates at
(a) high torque and high speed (b) low torque and low speed
(c) low torque and high speed (d) high torque and low speed
160. The most commonly used devices for differencing and amplification, in control system are
(a) BJTs (b) FETs
(c) op-Amp (d) either (a) or (b)
161. In control system the output of sensor is usually
(a) analog electrical signal (b) digital electric signal
(c) mechanical signal (d) (a) or (b)
162. DC tacho-generator can be used in
(a) Speed control (b) position control
(c) both (a) or (b) (d) neither (a) nor (b)
163. The entries in the first column of Routh array of fourth order are 5, 2, - 0.1, 2, 1. The number of poles in the right half plane are
(a) 1 (b) 2
(c) 3 (d) 4
164. For the factor $(1 + 0.5j\omega)$ the corner frequency is
(a) 1 rad/sec (b) 0.5 rad/sec
(c) 2 rad/sec (d) 0.25 rad/sec
165. Robotic manipulator arms mostly use
(a) hydraulic actuator (b) pneumatic actuator
(c) electric motor actuator (d) none of these
166. DMA stands for
(a) direct memory access (b) distributed memory address
(c) direct memory accumulator (d) decimal machine address

145. If system is to follow arbitrary inputs accurately, the bandwidth should be
(a) large (b) small
(c) very small (d) none of these
146. As the bandwidth increases, the cost of components generally
(a) decreases (b) increases
(c) may (a) or (b) (d) does not change
147. A lead compensator is basically a
(a) high pass filter (b) low pass filter
(c) band stop filter (d) band pass filter
148. The primary function of a lag compensator is to provide
(a) gain margin (b) phase margin
(c) both (a) & (b) (d) either (a) or (b)
149. A system has 12 poles and 2 zeros. Its high frequency asymptote in its magnitude plot has a slope of
(a) - 200 dB/decade (b) - 240 dB/decade
(c) - 280 dB/decade (d) - 320 dB/decade
150. The effect of adding poles and zeros can be determined quickly by
(a) Nichol's chart (b) Nyquist plot
(c) Bode plot (d) Root locus
151. Magnetic amplifier is used for amplification of
(a) voltage (b) power
(c) current (d) frequency
152. In position control system the device, used for providing rate-feedback voltage is
(a) Potentiometer (b) synchro-transmitter
(c) synchro- transformer (d) tacho-generator
153. Which of the following is used to obtain output position in a position control system?
(a) strain gauge (b) load cell
(c) synchro (d) thermistor
154. An electro-mechanical device which actuates a train of step angular movements in response to a train of input pulses on one to one basis is
(a) synchro control transformer (b) LVDT
(c) stepper motor (d) tacho-generator
155. For stable network, the real parts of poles and zeros of driving point function must be
(a) negative (b) zero or negative
(c) zero (d) positive

64. Which of the following parameters has the unit of ohms?
(a) h_{ie} (b) h_{re}
(c) h_{fe} (d) h_{oe}
65. A virtual ground is a ground for
(a) voltage (b) current
(c) both (a) & (b) (d) none of these
66. In an op-Amp common mode signal is applied to
(a) inverting terminal (b) non-inverting terminal
(c) both terminals (d) one or both terminals
67. A negative feedback can be of
(a) only one type (b) 2 types
(c) 3 types (d) 4 types
68. Which of the following binary numbers is equivalent to decimal 10?
(a) 1000 (b) 1001
(c) 1010 (d) 1100
69. Which of these are two state devices?
(a) lamp (b) punched card
(c) magnetic tape (d) all of above
70. Logic analyzer is
(a) multi channel oscilloscope (b) similar to logic pulser
(c) similar to current tracer (d) none of the above
71. Binary number 1101 is equal to which octal number given below?
(a) 13 (b) 14
(c) 15 (d) 17
72. In a 4 input AND gate, the total numbers of high outputs for 16 input states are
(a) 16 (b) 8
(c) 4 (d) 1
73. Which of these are universal gates?
(a) Only NOR (b) Only NAND
(c) NOR and NAND (d) NOR, NAND, OR
74. The number of NOT gates present in a 14 pin NOT gate IC is
(a) 8 (b) 6
(c) 5 (d) 4
75. Which of the following is true?
(a) SOP is two level logic (b) POS is two level logic
(c) Both SOP and POS are two level logic (d) Hybrid function is two level logic

76. In which function is each term known as minterm?
(a) SOP (b) POS
(c) Hybrid (d) Both SOP and POS
77. In the expression $(A+BC)$, the total number of minterms will be
(a) 2 (b) 3
(c) 4 (d) 5
78. In a four variable Karnaugh map eight adjacent cells gives a
(a) two variable term (b) single variable term
(c) three variable term (d) four variable term
79. As compared to TTL, ECL has
(a) lower power dissipation (b) lower propagation delay
(c) higher noise margin (d) higher propagation delay
80. TSL inverter has
(a) one input (b) two inputs
(c) three inputs (d) none of these
81. A 3 bit binary adder should use
(a) 3 full adders (b) 2 full adders and one half adder
(c) 1 full adder and two half adders (d) 3 half adders
82. BCD input 1000 is fed to a 7-segment display through a BCD to 7-segment detector. The segments which will light up are
(a) a, b, d (b) a, b, c
(c) a, b, g, e, d (d) all segments
83. How many data select lines are required in a 8:1 multiplexer?
(a) 1 (b) 2
(c) 3 (d) 4
84. It is desired to route data from many registers to one register. The device needed is
(a) decoder (b) multiplexer
(c) demultiplexer (d) counter
85. In a positive edge triggered JK Flip Flop, $J=1$, $K=0$ and clock pulse is rising. Q will be
(a) 0 (b) 1
(c) no change (d) toggle
86. A counter has a modulus of 10. The number of Flip Flops used is
(a) 10 (b) 5
(c) 4 (d) 3
87. A counter has 4 Flip Flops. It divides the input frequency by
(a) 16 (b) 8
(c) 4 (d) 2

133. Integral control action
(a) removes offset (b) leads to oscillations
(c) both (a) & (b) (d) neither (a) nor (b)
134. For any test point s on the real axis, the sum of all angular combinations of the complex conjugate poles is
(a) 90° (b) 180°
(c) 270° (d) 360°
135. If zeros at infinity are included in the count, the number of zeros of $G(s)H(s)$ is
(a) equal to number of poles (b) one more than the no. of poles
(c) one less than the no. of poles (d) none of these
136. Transport lag usually exists in
(a) thermal systems (b) hydraulic & thermal systems
(c) pneumatic systems (d) all the three systems
137. The angular location of poles depends on
(a) undamped natural frequency (b) damping ratio
(c) both (a) & (b) (d) neither (a) nor (b)
138. The distance of poles from origin depends on
(a) undamped natural frequency (b) damping ratio
(c) both (a) & (b) (d) neither (a) nor (b)
139. If poles lie in the first quadrant, damping ratio is
(a) 1 (b) more than 1
(c) less than 1 (d) zero
140. In Bode diagrams an octave is a frequency band from
(a) w to $10w$ (b) w to $8w$
(c) w to $4w$ (d) w to $2w$
141. In log magnitude Bode diagram the slope of high frequency asymptote of $(1 + jwT)$ is
(a) 20 dB per decade (b) 10 dB per decade
(c) 20 dB per octave (d) 10 dB per octave
142. The polar plot of $G(jw) = 1/jw$ is
(a) positive imaginary axis (b) positive real axis
(c) negative imaginary axis (d) negative real axis
143. For the transport lag $G(jw) = e^{-jwt}$, the polar plot is
(a) a semi circle (b) a circle
(c) an unit circle (d) none of these
144. The relative stability of a system is given by
(a) gain margin alone (b) phase margin alone
(c) both (a) & (b) (d) either (a) or (b)

122. A proportional controller is basically
(a) an amplifier with adjustable gain (b) an integrating amplifier
(c) an amplifier with infinite gain (d) an amplifier with almost zero gain
123. Which control action is also called rate control?
(a) proportional (b) derivative
(c) integral (d) (a) and (c)
124. Which control action can never be used alone?
(a) proportional (b) derivative
(c) integral (d) (b) and (c)
125. For a type-0 system and unit ramp input, the steady state error is
(a) zero (b) 1
(c) $1/K_v$ (d) ∞
126. A system has its two poles on the negative real axis and one pair of poles lies on $j\omega$ axis. The system is
(a) stable (b) unstable
(c) limitedly stable (d) either (a) or (c)
127. A lead compensator
(a) speeds up the transient response (b) increase the stability margin
(c) both (a) and (b) (d) none of these
128. The frequency at which phase angle is 180° is called
(a) Phase crossover frequency (b) stability limit frequency
(c) frequency of limited stability (d) gain margin frequency
129. A system has high gain and phase margins, the system is
(a) very stable (b) sluggish
(c) (a) and (b) (d) oscillatory
130. A system is highly oscillatory if
(a) Gain margin is high
(b) Gain margin is close to 1
(c) Gain margin is close to 1 and phase margin is zero
(d) Gain margin is high and phase margin is 180°
131. A thermometer requires 1 minute to indicate 98% of its final response to a step input. If it is a first order system then the time constant is
(a) 1 minute (b) 30 sec
(c) 15 sec (d) 6 sec
132. In a simple on-off controller with differential gap, the magnitude of differential gap determines the
(a) Level of accuracy (b) life of controller
(c) both (a) & (b) (d) neither (a) nor (b)

88. A 4 bit down counter can count from
(a) 0000 to 1111 (b) 1111 to 0000
(c) 000 to 111 (d) 111 to 000
89. In a shift register, shifting left by one bit means
(a) division by 2 (b) multiplication by 2
(c) subtraction by 2 (d) any of the above
90. Quantization error occurs in
(a) D/A converter (b) A/D converter
(c) both (a) and (b) (d) neither (a) nor (b)
91. Which of the following is error correcting code?
(a) EBCDIC (b) ASCII
(c) Hamming (d) Gray
92. A parity detector can detect
(a) single error only (b) single or odd number of errors
(c) two errors only (d) even number of errors
93. Which of the following contains an organic fluid?
(a) LED (b) LCD
(c) LED and LCD (d) none of these
94. Which of them has 10 inputs and 4 outputs?
(a) Decimal to BCD encoder (b) BCD to decimal decoder
(c) Octal to binary encoder (d) All encoders
95. Which of the following is equivalent to AND-OR realization?
(a) NAND-NOR (b) NOR-NOR
(c) NOR-NAND (d) NAND-NAND
96. The number of memory locations which 14 address bits can access is
(a) 1024 (b) 2048
(c) 4096 (d) 16384
97. State transition table and state transition diagram form part of design steps for
(a) combinational circuits (b) sequential circuits
(c) delay circuits (d) all of the above
98. In digital circuits Schottky transistors are preferred over normal transistors because of their
(a) low propagation delay (b) lower power dissipation
(c) higher propagation delay (d) higher power dissipation
99. A transistor is used as non-saturated switch to eliminate
(a) turn on time (b) turn off time
(c) storage time (d) delay time

100. The initial state of a MOD-16 counter is 0110. After 37 clock pulses the state of the counter will be
(a) 1011 (b) 0110
(c) 0101 (d) 0001
101. Which of the following can be used as Parallel to series converter?
(a) decoder (b) counter
(c) encoder (d) multiplexer
102. A Johnson counter with 5 flips flops will have
(a) 5 states (b) 10 states
(c) 32 states (d) ∞ states
103. A 4 bit ripple counter uses flip flops with propagation delay of 50 nsec each. The maximum clock frequency which can be used is
(a) 5MHz (b) 10MHz
(c) 20MHz (d) 25MHz
104. The advantages of Flash memory over EEPROM are
(a) higher density (b) lower cost
(c) both (a) & (b) (d) none of these
105. A full adder can be made out of
(a) two half adders (b) two half adders and an OR gate
(c) two half adders and an AND gate (d) three half adders
106. Flash ADC is
(a) Serial ADC (b) Parallel ADC
(c) Series-parallel ADC (d) Successive approximation ADC
107. Which one of the following is a D/A conversion technique?
(a) Successive approximation (b) Weighted resistor
(c) Dual slope (d) Single slope
108. Out of latch and flip flop, which has clock input?
(a) latch only (b) flip flop only
(c) both (a) & (b) (d) none of these
109. A 4 bit DAC gives an output of 4.5V for input of 1001. If input is 0110, the output is
(a) 1.5 V (b) 2.0 V
(c) 3.0V (d) 4.5 V
110. TTL circuit with active pull up is preferred because of its suitability for
(a) wired AND operation (b) bus operated system
(c) wired logic operation (d) reasonable dissipation and speed.

111. The resolution of an n bit DAC with a maximum input of 5V is 5mV, the value of n is
(a) 8 (b) 9
(c) 10 (d) 11
112. In a shift register the data is loaded in one operation but shifted out one bit at a time. The shift register is
(a) serial in-serial out (b) parallel in serial out
(c) serial in-parallel out (d) parallel in-parallel out
113. A 12 bit ADC is operating with 1 μ sec clock period. Total conversion time is 14 μ sec. ADC is
(a) flash type (b) counting type
(c) Integrating type (d) successive approximation type
114. The advantage of using dual slope ADC in digital voltmeter is that
(a) its conversion time is small (b) its accuracy is high
(c) its output is in BCD (d) does not require a comparator
115. In a J-K flip flop the input J=K=1 causes flip flop to
(a) set (b) reset
(c) no change (d) toggle
116. The process of entering data into ROM is called
(a) writing (b) burning
(c) decoding (d) registering
117. A 6 bit DAC uses binary weighted resistors. If MSB resistor is 20K Ω , the value of LSB resistor is
(a) 20K Ω (b) 80K Ω
(c) 32K Ω (d) 640K Ω
118. In force voltage analogy the quantity analogous to spring constant K is
(a) R (b) C
(c) L (d) 1/C
119. The units of thermal capacitance is
(a) K cal/ $^{\circ}$ C (b) $^{\circ}$ C/K cal
(c) $^{\circ}$ C sec/Kcal (d) none of these
120. For a second order system delay time t_d is the time required to reach
(a) half the final value the very first time (b) the final value the very first time
(c) 90% of the final value the very first time (d) none of these
121. For a first order system having transfer function $1/(1+sT)$, the unit step response is
(a) $1 - e^{-t/T}$ (b) $e^{-t/T}$
(c) $e^{-t/T} - 1$ (d) $1 + e^{-t/T}$