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ROLL No.

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TEST BOOKLET No.

146

TEST FOR POST GRADUATE PROGRAMMES

**ELECTRONIC SCIENCE**

Time: 2 Hours

Maximum Marks: 450

**INSTRUCTIONS TO CANDIDATES**

1. You are provided with a Test Booklet and an Optical Mark Reader (OMR) Answer Sheet to mark your responses. Do not soil the Answer Sheet. Read carefully all the instructions given on the Answer Sheet.
2. Write your Roll Number in the space provided on the top of **this page**.
3. Also write your Roll Number, Test Code, and Test Subject in the columns provided for the same on the **Answer Sheet**. Darken the appropriate bubbles with a **Ball Point Pen**.
4. The paper consists of 150 objective type questions. All questions carry equal marks.
5. Each question has four alternative responses marked **A, B, C** and **D** and you have to **darken** the bubble corresponding to the correct response fully by a **Ball Point Pen** as indicated in the example shown on the Answer Sheet.
6. Each correct answer carries **3** marks and each wrong answer carries **1** minus mark.
7. Space for rough work is provided at the end of this Test Booklet.
8. You should return the Answer Sheet to the Invigilator before you leave the examination hall. However, you can retain the Test Booklet.
9. Every precaution has been taken to avoid errors in the Test Booklet. In the event of any such unforeseen happening, the same may be brought to the notice of the Observer/Chief Superintendent in writing. Suitable remedial measures will be taken at the time of evaluation, if necessary.



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### ELECTRONIC SCIENCE

1. An intrinsic semiconductor at the absolute zero temperature
  - (A) behaves like a metallic conductor
  - (B) behaves like an insulator
  - (C) has a large number of holes
  - (D) has a large number of electrons
  
2. At room temperature, the current in an intrinsic semiconductor is due to
  - (A) Holes
  - (B) Electronics
  - (C) Ions
  - (D) Holes and Electronics
  
3. In an n-type semiconductor, as temperature  $T$  increases, the Fermi level  $E_F$ 
  - (A) moves towards conduction band
  - (B) moves towards middle of forbidden energy gap
  - (C) does not vary
  - (D) may or may not shift depending upon the concentration of donor atoms
  
4. Ratings on a capacitor are given  $25\mu\text{F}$ , 12 V. Also a minus sign is written near one of its terminals. The capacitor is
  - (A) Mica capacitor
  - (B) Ceramic capacitor
  - (C) Electrolytic capacitor
  - (D) Paper capacitor
  
5. Which of the following doping will produce a p-type semiconductor?
  - (A) Germanium with phosphorus
  - (B) Silicon with germanium
  - (C) Germanium with antimony
  - (D) Silicon with indium
  
6. Which of the following is an active device?
  - (A) An electric bulb
  - (B) A resistor
  - (C) A BJT
  - (D) A transformer



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7. A virtual ground
- (A) is a ground for voltage
  - (B) is a ground for both voltage and current
  - (C) is ground for current
  - (D) is a ground for voltage but not for current
8. The program used to convert mnemonics to machine code is
- (A) Fortran
  - (B) C++
  - (C) Assembler
  - (D) Opcode
9. A transistor is said to be in ..... region when both the junctions are forward biased.
- (A) active
  - (B) saturation
  - (C) cut-off
  - (D) passive
10. Loading effect of a voltmeter can be reduced by
- (A) increasing the load resistance
  - (B) increasing the internal resistance of voltmeter
  - (C) decreasing the load resistance
  - (D) decreasing the internal resistance of voltmeter
11. The highest voltage gain can be obtained from which of the following?
- (A) CB configuration
  - (B) CE configuration
  - (C) CC configuration
  - (D) All of the above
12. Power gain of emitter follower usually is
- (A) Unity
  - (B) Less than one
  - (C) More than one
  - (D) None of the above
13. Ripple factor of a half wave rectifier is
- (A) more than two
  - (B) more than one
  - (C) less than one
  - (D) zero



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14. The self-destruction of an unstabilised transistor due to rise in temperature is called
- (A) Thermal runaway                      (B) Heat dissipation  
(C) Thermocouple                         (D) Q-factor
15. A Bark-Hausen criterion for oscillator stability is
- (A)  $A\beta = 0$                                  (B)  $A\beta = 1$   
(C)  $-A\beta = 1$                                  (D)  $-A\beta = 0$
16. In Frequency Division Multiplexing, all signals are sent at the same time but each occupies ..... frequency band.
- (A) same                                         (B) different  
(C) either (A) or (B)                         (D) None of the above
17. In JFET operating above pinch-off voltage, the
- (A)  $I_D$  remains practically constant  
(B)  $I_D$  starts decreasing  
(C)  $I_D$  increases rapidly  
(D) depletion region becomes smaller
18. What is the binary equivalent of the decimal number 465?
- (A) 111010001                                 (B) 110110000  
(C) 111010000                                 (D) 111100000
19. How many Flip-Flops are required for mod-16 counter?
- (A) 5     (B) 6  
(C) 3     (D) 4
20. EPROM contents can be erased by exposing it to
- (A) ultraviolet rays                             (B) infrared rays  
(C) burst of microwaves                         (D) intense heat radiations



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21. A ring counter consisting of five Flip-Flops will have
- (A) 5 states (B) 10 states  
(C) 32 states (D) infinite states
22. The 2's complement of the number 0010011 is
- (A) 0101110 (B) 0111110  
(C) 0110010 (D) 1101101
23. The gates required to build a half adder are
- (A) EX-OR gate and NOR gate  
(B) EX-OR gate and AND gate  
(C) EX-OR gate and OR gate  
(D) Four NAND gates
24. The code where all successive numbers differ from their preceding number by single bit is
- (A) Binary code (B) BCD  
(C) Excess - 3 (D) Gray
25. If the input to T-flip-flop is 100 Hz signal, the final output of the four T-flip-flops in cascade is
- (A) 1000 Hz (B) 100 Hz  
(C) 6.25 Hz (D) 12.5 Hz
26. The digital logic family which has the lowest propagation delay time is
- (A) ECL (B) TTL  
(C) CMOS (D) PMOS
27. The device which changes from serial data to parallel data is
- (A) Counter (B) Multiplexer  
(C) Demultiplexer (D) Flip-Flop



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28. The A/D converter whose conversion time is independent of the number of bits is
- (A) Dual slope (B) Counter type  
(C) Parallel conversion (D) Successive approximation
29. The excess 3 code of decimal number 26 is
- (A) 0100 1001 (B) 01011001  
(C) 1000 1001 (D) 01001101
30. Which of the following memories stores the most number of bits?
- (A) 5M×8 memory (B) 1M×16 memory  
(C) 4M×5memory (D) 12M×1memory
31. In digital ICs, Schottky transistors are preferred over normal transistors because of their
- (A) lower propagation delay  
(B) higher propagation delay  
(C) lower power dissipation  
(D) higher power dissipation
32. The access time of ROM using bipolar transistors is about
- (A) 1 sec (B) 1 msec  
(C) 1 μsec (D) 1 nsec
33. Which is non resonant antenna?
- (A) Marconi (B) Rhombic  
(C) Yagi-Uda (D) Discone

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34. For a transmission line terminated in its characteristic impedance, which of the following statement is incorrect?
- (A) It is a smooth line
  - (B) The energy distribution between magnetic and electric field is not equal
  - (C) Standing wave does not exist
  - (D) Efficiency of transmission of power is maximum
35. Radiation resistance of a  $\lambda/2$  dipole is
- (A) 73 ohm
  - (B) 75 ohm
  - (C)  $120 \pi$  ohm
  - (D) 377 ohm
36. The dominant mode of rectangular wave guide is
- (A)  $TE_{11}$
  - (B)  $TM_{11}$
  - (C)  $TE_{01}$
  - (D)  $TE_{10}$
37. Depth of penetration in free space is
- (A)  $\alpha$
  - (B)  $1/\alpha$
  - (C) 0
  - (D)  $\infty$
38. For a  $300\Omega$  antenna operating with 5A of current, the radiated power is
- (A) 7500 W
  - (B) 750 W
  - (C) 75 W
  - (D) 7500 mW
39. The lower cut-off frequency of a rectangular waveguide with inside dimensions (3×4.5 cm) operating at 10 GHz is
- (A) 10 GHz
  - (B) 9 GHz
  - (C) 10/9GHz
  - (D) 10/3GHz
40. How many op-amps are required to implement this equation  $V_o = V_i$ ?
- (A) Four
  - (B) Three
  - (C) Two
  - (D) One



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41. A difference between a passive filter and an active filter is that a passive filter uses amplifier(s), but an active filter does not. This is
- (A) True
  - (B) False
  - (C) True in the case of Butter worth filter
  - (D) True in the case of Chebyshev filters
42. Higher band widths are possible in.....
- (A) mono mode step index fiber
  - (B) multimode step index fiber
  - (C) multimode graded index fiber
  - (D) All of the above
43. In ..... modulation bandwidth doubling and carrier power wasted are avoided.
- (A) AM
  - (B) FM
  - (C) SSB
  - (D) DSBSC
44. In a communication system, the noise is most likely to affect the signal
- (A) at the transmitter
  - (B) in the channel
  - (C) at the receiver
  - (D) in the source
45. Bandwidth of FM
- (A) is greater than that of AM
  - (B) is less than that of AM
  - (C) is equal to that of AM
  - (D) cannot predict
46. Modems are used for carrying
- (A) digital data over digital line
  - (B) digital data over analog line
  - (C) analog data over analog line
  - (D) analog data over digital line



47. In standing wave pattern on a transmission line
- (A) voltage and current nodes coincide
  - (B) voltage and current antinode coincide
  - (C) voltage nodes and current antinodes as well as current nodes and voltage antinodes coincide
  - (D) both (A) and (B)
48. Which of the following is an advantage to use fiber optic data transmission?
- (A) Resistance to the data theft
  - (B) Fast data transmission rate
  - (C) Low noise level
  - (D) All of the above
49. Which among the following is not a feature of Op-amp?
- (A) High CMRR
  - (B) High gain
  - (C) Low output impedance
  - (D) Low input impedance
50. Avalanche break down not happens in
- (A) Zener diode
  - (B) Varactor diode
  - (C) Junction diode
  - (D) Both (B) and (C)
51. A full wave bridge rectifier is supplied voltage at 50 Hz. The lowest ripple frequency will be
- (A) 300Hz
  - (B) 200Hz
  - (C) 150Hz
  - (D) 100Hz
52. Quantization noise occurs in
- (A) TDM
  - (B) PCM
  - (C) FDM
  - (D) WDM



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53. Which of the following materials find application in MASER?
- (A) Ferrimagnetic (B) Paramagnetic  
(C) Ferromagnetic (D) Diamagnetic
54. The value of numerical aperture in optical fibre is
- (A) Greater than 1 (B) Less than 1  
(C) Equal to 1 (D) Equal to  $\infty$
55. What bandwidth is needed for an FM signal that has a peak deviation of  $\pm 3$  KHz and handles audio signals from 200 Hz to 5 KHz?
- (A) 6 KHz (B) 9.6 KHz  
(C) 10 KHz (D) 16 KHz
56. In FM, when frequency deviation doubled, then
- (A) modulation index is decreased  
(B) modulation index is doubled  
(C) modulation index halved  
(D) no change occurs in modulation index values
57. What is SIM?
- (A) Select Interrupt Mask (B) Sorting Interrupt Mask  
(C) Set Interrupt Mask (D) Start Instruction Mode
58. Superposition theorem can be applied only to circuits having
- (A) Resistive elements (B) Passive elements  
(C) No-linear elements (D) Linear bilateral elements
59. An AM demodulator can be implemented with
- (A) a linear multiplier followed by low pass filter  
(B) a linear multiplier followed by high-pass filter  
(C) a diode followed by high pass filter  
(D) a linear multiplier followed by band-stop filter



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60. In a bipolar transistor, stability factor for a fixed bias circuit is given by
- (A)  $S = 1 / (1 + \beta)$  (B)  $S = 1 / (\beta - 1)$   
(C)  $S = (\beta - 1)^2$  (D)  $S = \beta + 1$
61. Phase Lock Loop (PLL) system is used for the detection of
- (A) PM (B) AM  
(C) FM (D) QAM
62. Which is the 8086 instruction that will form the 2's complement?
- (A) ADD (B) CMP  
(C) NOT (D) NEG
63. LXIH 4000 is an example of
- (A) Direct addressing mode (B) Indirect addressing mode  
(C) Implied addressing mode (D) Immediate address mode
64. The status of ..... flag cannot be checked.
- (A) auxiliary carry (B) carry  
(C) parity (D) zero
65. In 8085, name the 16 bit register
- (A) Stack pointer (B) Program counter  
(C) Both (A) and (B) (D) Instruction register
66. Fetching the next instruction while the current instruction is executing is known as
- (A) DMA (B) Pipelining  
(C) Parallel processing (D) Cache



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67. Maximum number of I/O devices that can interface with 8085 is
- (A) 8 (B) 256  
(C) 1024 (D) 512
68. When a BJT operates in cut-off
- (A)  $V_{CE} = 0$  (B)  $V_{CE} = V_{CC}$   
(C)  $V_{CE}$  has negative value (D)  $I_C$  is maximum
69. Comanding is used
- (A) to overcome quantizing noise in PCM  
(B) to protect small signals in PCM from quantizing noise  
(C) to reduce impulse noise in PCM receivers  
(D) to increase power content of the modulating signal
70. A MOSFET is sometimes called .....FET.
- (A) many gate (B) open gate  
(C) insulated gate (D) shorted gate
71. The emitter of a transistor is generally doped the heaviest because it
- (A) has to dissipate maximum power  
(B) has to supply the charge carriers  
(C) is the first region of the transistor  
(D) must possess low resistance
72. The LVDT is primarily used for the measurement of
- (A) humidity (B) velocity  
(C) acceleration (D) displacement
73. As a result of introduction of negative feedback which of the following will not decrease?
- (A) Bandwidth (B) Overall gain  
(C) Distortion (D) Instability



80. Inverse Z transform of 1 is

- (A)  $\delta(n+1)$  (B)  $\delta(n)$   
 (C)  $\delta(n-1)$  (D)  $u(n)$

81. The Fourier Transform of  $x[n] = a^n u[n-4]$  is

- (A)  $\frac{a^4 e^{-j4\omega}}{1 - ae^{-j\omega}}$  (B)  $\frac{a^4}{1 - ae^{-j\omega}}$   
 (C)  $\frac{a^4 e^{-j4\omega}}{2}$  (D)  $\frac{a^4 e^4}{e^{j\omega^4}}$

82. Energy associated with function  $f(t) = e^{-t} u(t)$  is

- (A) 0 (B) 1/3  
 (C) 1/2 (D) 1/4

83. Intrinsic impedance of a free space is

- (A) 350  $\Omega$  (B) 377  $\Omega$   
 (C) infinite (D) zero

84. The wave propagation occurs without attenuation in case of

- (A) perfect dielectric (B) semi-conductor  
 (C) conductor (D) All of the above

85. A transmission line of characteristic impedance 50 ohm is terminated in a load of j100 ohm. The VSWR on the line is

- (A) 1 (B) 2  
 (C)  $\infty$  (D) None of the above

86. The following waves do not exist in waveguides

- (A) TM waves (B) TE waves  
 (C) TEM waves (D) TE and TM waves



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87. In a transmission line, the distance between adjacent maxima and minima of a standing wave is

- (A)  $\lambda/8$  (B)  $\lambda/4$   
(C)  $\lambda/2$  (D)  $\lambda$

88. A transmission line of characteristic impedance  $Z_0$  is terminated in  $Z_0$ . The input impedance is

- (A)  $Z_0/2$  (B)  $Z_0$   
(C)  $2Z_0$  (D)  $4Z_0$

89. In a broadcast superheterodyne receiver, the

- (A) local oscillator operates below the signal frequency  
(B) mixer input must be tuned to the signal frequency  
(C) local oscillator frequency is normally double the IF  
(D) RF amplifier normally works at 455 KHz above the carrier frequency

90. Entropy is basically a measure of

- (A) rate of information (B) average information  
(C) probability of information (D) disorder of information

91. Thermal noise power in a resistor R is proportional to

- (A) R (B)  $1/R$   
(C)  $R^2$  (D) Independent of R

92. The skip distance is

- (A) independent of frequency  
(B) independent of the state of ionization  
(C) independent of transmitting power  
(D) dependent on transmitting power



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93. Spectral density of white noise
- (A) varies with frequency                      (B) is constant  
(C) varies with bandwidth                      (D) None of the above
94. Quadrature multiplexing is a form of
- (A) time division multiplexing  
(B) frequency division multiplexing  
(C) combined time and frequency division multiplexing  
(D) None of the above
95. In TV, the contrast is controlled by
- (A) DC voltage in video circuit  
(B) AC voltage in video circuit  
(C) Both (A) and (B)  
(D) None of the above
96. ARQ stands for
- (A) Accelerated redirection facility  
(B) Amplitude ratio detector quantizing noise  
(C) Automatic repeat request  
(D) Aerial range quartz crystal
97. In a klystron amplifier the input cavity is called
- (A) Buncher    (B) Catcher  
(C) Pierce gun    (D) Collector
98. Microwave resonators are used in
- (A) microwave oscillators  
(B) microwave narrow band amplifier  
(C) microwave frequency metres  
(D) All of the above



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99. In a TWT the amplitude of resultant wave travelling down the helix
- (A) increases exponentially      (B) increases linearly  
(C) decreases exponentially      (D) is almost constant
100. Which of the following is not a travelling wave?
- (A)  $e = E_m \sin(\beta x - \omega t)$       (B)  $e = E_m \cos(\beta x - \omega t)$   
(C)  $e = E_m \sin(\omega t - \beta x)$       (D)  $e = E_m \sin(\beta x)$
101. Which of the following parameters is negligible in transmission lines?
- (A) R      (B) L  
(C) C      (D) G
102. The diagram to show distance time history of electrons in klystron amplifier is called
- (A) apple gate diagram      (B) asynchronous diagram  
(C) bunching diagram      (D) velocity modulation diagram
103. Which of the following devices uses a slow wave structure?
- (A) Klystron two cavity amplifier  
(B) Klystron multicavity amplifier  
(C) Reflex klystron oscillator  
(D) TWT
104. A waveguide section in a microwave circuit acts as
- (A) LP filter      (B) Band pass filter  
(C) HP filter      (D) Band stop filter
105. Given a MOD-14 ripple counter using J-K flip-flops. If the clock frequency to the counter is 30 KHz, then the output frequency of the counter will be
- (A) 2.2 KHz      (B) 30 KHz  
(C) 2.14 KHz      (D) 3.2 KHz



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106. Schottky TTL gates have propagation delay time of the order of
- (A) 6 ns (B) 5 ns  
(C) 2 ns (D) 8 ns
107. A one-to-sixteen demultiplexer requires
- (A) 2 select input lines (B) 3 select input lines  
(C) 8 select input lines (D) 4 select input lines
108. The number of states in its counting sequence that a ring counter consisting of 'n' flip-flops can have is
- (A)  $2^n - 1$  (B)  $2^{n-1}$   
(C) n (D)  $2n+1$
109. In applications where measurement of a physical quantity is involved, the OPAMP circuit recommended is
- (A) basic non-inverting amplifier  
(B) a comparator  
(C) an active filter  
(D) an instrumentation amplifier
110. For a 3-bit flash ADC, the number of comparators required are
- (A) 5 (B) 9  
(C) 7 (D) 3
111. The unity gain bandwidth of 741 OPAMP is typically
- (A) 4 MHz (B) 2 MHz  
(C) 6 MHz (D) 1 MHz
112. The conversion time of a dual-slope ADC is typically in the range of
- (A) 5 to 10 ns (B) 10 to 100 ns  
(C) 200 ns (D) 1 to 3 ns



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113. The ratio of change in input offset voltage when variation in supply voltage is made, is called
- (A) PSRR (B) CMRR  
(C) transient response (D) input offset voltage stability
114. Removing bypass capacitor across the emitter-leg resistor in a CE amplifier causes
- (A) increase in current gain (B) decrease in current gain  
(C) increase in voltage gain (D) decrease in voltage gain
115. Hysteresis is desirable in Schmitt-trigger, because
- (A) energy is to be stored/discharged in parasitic capacitances  
(B) effects of temperature would be compensated  
(C) devices in the circuit should be allowed time for saturation and desaturation  
(D) it would prevent noise from causing false triggering
116. The important characteristic of emitter-follower is
- (A) high input impedance and high output impedance  
(B) high input impedance and low output impedance  
(C) low input impedance and low output impedance  
(D) low input impedance and high output impedance
117. In class-A amplifier, the output current flows for
- (A) a part of the cycle of the input signal  
(B) the full cycle of the input signal  
(C) half the cycle of the input signal  
(D) 3/4th of the cycle of the input signal



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118. A phase shift oscillator uses
- (A) LC tuning
  - (B) Piezo-electric crystal
  - (C) Balanced bridge
  - (D) Variable frequency operation
119. Ready pin of a microprocessor is used
- (A) to indicate that the microprocessor is ready to receive inputs
  - (B) to indicate that the microprocessor is ready to receive outputs
  - (C) to introduce wait states
  - (D) to provide direct memory access
120. Itanium processor of Intel is a
- (A) 32 bit microprocessor
  - (B) 64 bit microprocessor
  - (C) 128 bit microprocessor
  - (D) 256 bit microprocessor
121. The PCI bus is the important bus found in all the new Pentium systems because
- (A) it has plug and play characteristics
  - (B) it has ability to function with a 64 bit data bus
  - (C) any Microprocessor can be interfaced to it with PCI controller or bridge
  - (D) All of the above
122. In a virtual memory system, the addresses used by the programmer belongs to
- (A) memory space
  - (B) physical addresses
  - (C) address space
  - (D) main memory address
123. DMA interface unit eliminates the need to use CPU registers to transfer data from
- (A) MAR to MBR
  - (B) MBR to MAR
  - (C) I/O units to memory
  - (D) Memory to I/O units



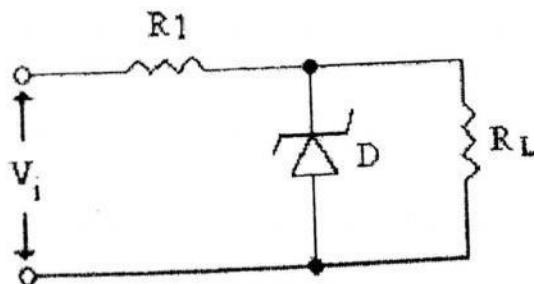
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124. Which is true for a typical RISC architecture?
- (A) Micro programmed control unit
  - (B) Instruction takes multiple clock cycles
  - (C) Have few registers in CPU
  - (D) Emphasis on optimizing instruction pipelines
125. CPU checks for an interrupt signal during
- (A) Starting of last machine cycle
  - (B) Last T-State of instruction cycle
  - (C) First T-State of interrupt cycle
  - (D) Fetch cycle
126. Silicon diodes are preferred to Germanium for high temperature operation because
- (A) doping of silicon is simple process
  - (B) rate of increase of reverse saturation current with temperature is more in case of silicon
  - (C) the reverse saturation current of silicon diodes is smaller than that of germanium
  - (D) silicon diodes can be used to rectify even small voltages
127. In an unbiased PN junction the current in equilibrium is
- (A) zero because no charge cross the junction
  - (B) zero because equal number of charges cross the junction
  - (C) due to diffusion of minority carriers
  - (D) due to diffusion of majority carriers
128. In a regulated power supply using a Zener diode the unregulated input voltage as compared to the regulated output voltage must be
- (A) same
  - (B) smaller
  - (C) larger
  - (D) larger with opposite polarity



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129. The diffusion capacitance of PN junction
- (A) decreases with increasing current and increasing temperature
  - (B) decreases with decreasing current and increasing temperature
  - (C) increases with increasing current and increasing temperature
  - (D) does not depend on current and temperature
130. In an intrinsic semiconductor, the Fermi-level is
- (A) closer to the valence band
  - (B) midway between conduction and valence band
  - (C) closer to the conduction band
  - (D) within the valence band
131. In an amplifier with negative feedback
- (A) only the gain of the amplifier is affected
  - (B) only the gain and bandwidth of the amplifier are affected
  - (C) only the input and output impedances are affected
  - (D) All of the four parameters mentioned above would be affected
132. In the voltage regulator shown below, if the current through the load decreases,



- (A) the current through  $R_1$  will increase.
- (B) the current through  $R_1$  will decrease.
- (C) zener diode current will increase.
- (D) zener diode current will decrease



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133. The lowest output impedance is obtained in case of BJT amplifiers for
- (A) CB configuration (B) CE configuration  
(C) CC configuration (D) CE with RE configuration
134. In an amplifier with negative feedback, the gain of the basic amplifier is 100 and it employs a feedback factor of 0.02. If the input signal is 40mV, determine voltage gain with feedback.
- (A) 33.33 (B) 3.33  
(C) 333.3 (D) 1.33
135. A BJT has a base current of 250  $\mu\text{A}$  and emitter current of 15mA. Determine  $\beta$ .
- (A) 590 (B) 5.9  
(C) 59 (D) 15
136. In general, the reactance of inductors increases with
- (A) increasing AC frequency (B) decreasing AC frequency  
(C) decreasing applied voltage (D) increasing applied voltage
137. The color of light emitted from the LED like GaAs depends on
- (A) forward bias alone  
(B) forward bias current  
(C)  $\lambda$  of light focused on the diode  
(D) reverse breakdown voltage
138. The minimum amount of hardware required to make a lowpass filter is
- (A) a resistance, a capacitance and an opamp  
(B) a resistance, an inductance and an opamp  
(C) a resistance and a capacitance  
(D) a resistance, a capacitance and an inductance



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139. In a double tuned circuit, consisting of two magnetically coupled, identical high-Q tuned circuits, at the resonance frequency of either circuit, the amplitude response has
- (A) a peak always                      (B) a dip always  
(C) either a peak or a dip              (D) neither a peak nor a dip
140. In a 2-terminal network containing at least one inductor and one capacitor, resonance condition exists only when the input impedance of the network is
- (A) purely resistive                      (B) purely reactive  
(C) finite                                      (D) infinite
141. Two resistances  $R_1$  and  $R_2$  give combined resistance of 4.5 ohms when in series and 1 ohm when in parallel. The resistances are
- (A) 3 ohms and 6 ohms                      (B) 3 ohms and 9 ohms  
(C) 1.5 ohms and 3 ohms                      (D) 1.5 ohms and 0.5 ohms
142. Solar cells
- (A) give high output current of 0.5A  
(B) are same as photovoltaic cells  
(C) both (A) and (B)  
(D) None of the above
143. The reverse recovery time of a Schottky diode is
- (A) 50ms                                      (B) 50  $\mu$ s  
(C) 50 ns                                      (D) 50 ps
144. The operating state that distinguishes a SCR from a diode is
- (A) forward conduction state              (B) forward blocking state  
(C) reverse conduction state              (D) reverse blocking state





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145. A network N is to be connected to load of 500 ohms. If the Thevenin's equivalent voltage and Norton's equivalent current of N are 5Volts and 10mA respectively, the current through the load will be
- (A) 10mA (B) 5mA  
(C) 2.5mA (D) 1mA
146. A stable system must have
- (A) zero or negative real part for poles and zeros.  
(B) atleast one pole or zero lying in the right-half s-plane.  
(C) positive real part for any pole or zero.  
(D) negative real part for all poles and zeros
147. The feedback factor at the frequency of oscillation of a Wien bridge oscillator is
- (A) 3 (B) 1/3  
(C) 1/29 (D) 3/29
148. If the peak value of the input voltage to a half wave rectifier is 28.28 volts and no filter is used, the maximum dc voltage across the load will be
- (A)  $20\sqrt{2}V$  (B) 15 V  
(C) 9 V (D) 14.14 V
149. A resistor used in colour TV has the following colour bands: yellow, violet, orange and silver. Its nominal value is
- (A)  $4.7 K\Omega \pm 10 \%$  (B)  $4.7 K\Omega \pm 5 \%$   
(C)  $47 K\Omega \pm 10 \%$  (D)  $470 K\Omega \pm 5 \%$
150. An ideal voltage source of 12 V provides a current of 150 mA to a load connected across it. If the load impedance is halved, the new load current will be
- (A) 0.3 A (B) 0.15 A  
(C) 0.6 A (D) 1.2 A