Hall Ticket Number

(To be filled by the Candidate)

S. No. **234512**

Booklet Code **B**

SET CODE
SC-1

Signature of the Invigilator

INSTRUCTIONS TO THE CANDIDATE

(Read the Instructions carefully before Answering)

1. Separate Optical Mark Reader (OMR) Answer Sheet is supplied to you along with Question Paper Booklet. Please read and follow the instructions on the OMR Answer Sheet for marking the responses and the required data.
2. The candidate should ensure that the booklet code printed on OMR sheet and question paper booklet code supplied are same.
3. **Immediately on opening the Question Paper Booklet by tearing off the paper seal please check for (i) The same booklet code (A/B/C/D) on each page, (ii) Serial Number of the questions (1-200), (iii) The number of pages and (iv) Correct Printing.** In case of any defect, please report to the invigilator and ask for replacement of booklet with same code within five minutes from the commencement of the test.
4. Electronic gadgets like Cell Phone, Pager, Calculator, Watches and Mathematical/Log Tables are not permitted into the examination hall.
5. Darken the appropriate circles of 1, 2, 3 or 4 in the OMR sheet corresponding to correct or the most appropriate answer to the concerned question number in the sheet. Darkening of more than one circle against any question automatically gets invalidated.
6. Rough work should be done only in the space provided in the Question Paper Booklet.
7. Return the OMR Answer Sheet and Question paper booklet to the invigilator before leaving the examination hall. Failure to return is liable for criminal action.
8. The duplicate OMR sheet shall be taken away by the candidate and should be preserved till the declaration of results.

This Booklet consists of 29 Pages for 200 Questions + 02 Pages of Rough Work + 01 Title Page i.e. Total 32 Pages.

SPACE FOR ROUGH WORK

SC-1 **Booklet Code** **B**

Time : 3 Hours Marks : 200

Instructions :

(i) Each question carries *one* mark.

(ii) Choose the correct or most appropriate answer from the given options to the following questions and darken, with blue/black ball point pen, the corresponding digit **1, 2, 3** or **4** in the circle pertaining to the question number concerned in the OMR Answer Sheet, separately supplied to you.

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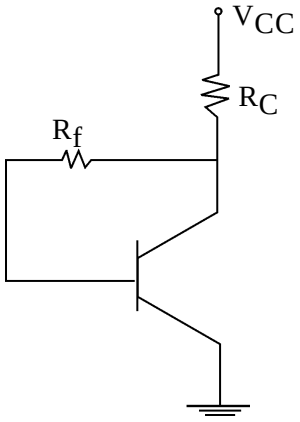
1. A microprocessor is basically
   (1) a preprogrammed analog IC (2) a preprogrammed digital IC
   (3) a programmable digital IC (4) a high power digital IC

---

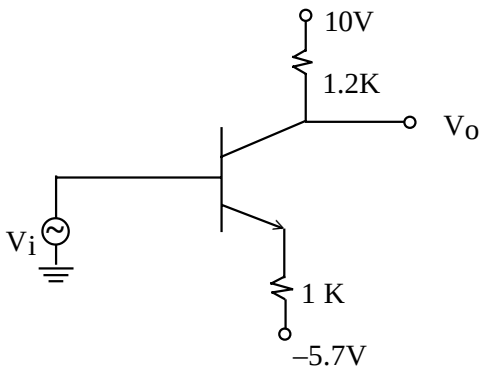
2. Find the operating point (V_{CE}, I_C) of the transistor if V_{CC} = 10 V, R_C = 2.7 K, R_f = 200 K, β = 99, V_{BE} = 0.6V



   (1) 4.6 V and 1.98 mA
   (2) 3.18 V and 2.5 mA
   (3) 5.4 V and 1.56 mA
   (4) 4.2 V and 2.1 mA

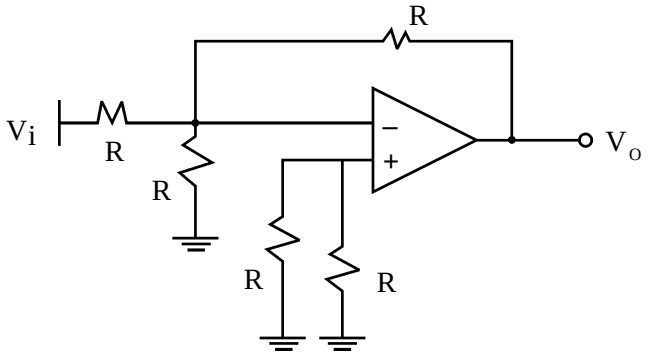
---

3. Find the small signal voltage gain in the following amplifier. Take $\beta >> 1$



   (1) 0.83 (2) 1.2 (3) –0.83 (4) –1.2

4. Find V_0



(1) V_i (2) $-V_i$

(3) $\frac{Vi}{2}$ (4) $\frac{-Vi}{2}$

---

5. An amplifier has input impedance of 50 Ω and drives a load of 100 Ω. When its input is 1V, its output is 10 V. What is its power gain in dB?

(1) 20 dB (2) 16.99 dB

(3) 34 dB (4) 10 dB

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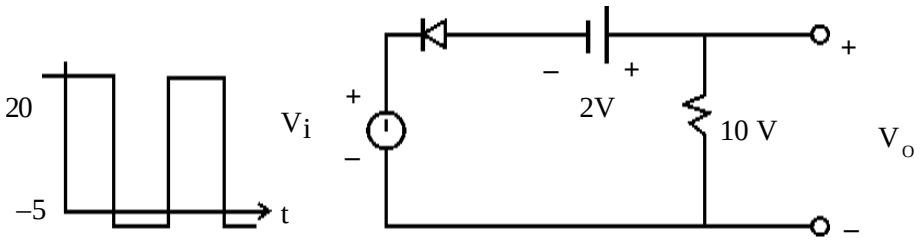
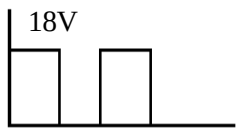
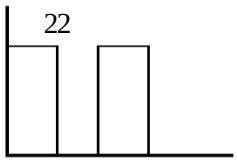
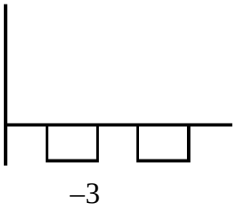
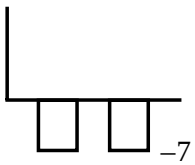
6. What will be the output voltage for the circuit given below?



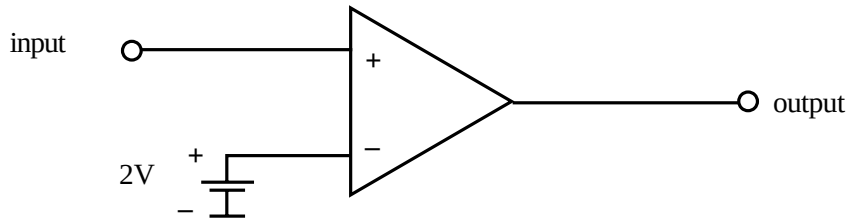
(1) 

(2) 

(3) 

(4) 

7. If the input to the ideal comparator shown below is a sinewave of peak to peak 8 V without a dc component, what is the duty cycle of output?



(1) $\frac{1}{2}$ (2) $\frac{1}{3}$ (3) $\frac{1}{6}$ (4) $\frac{1}{12}$

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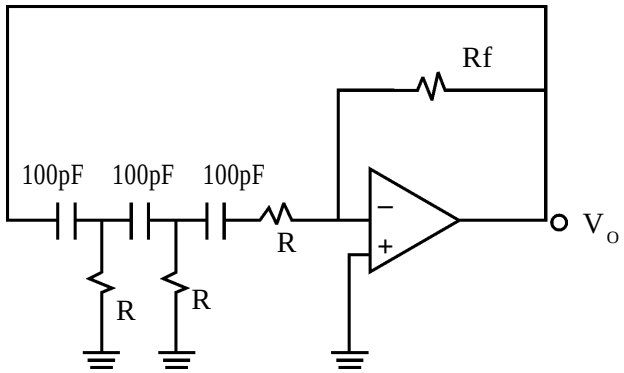
8. The phase shift oscillator operates at 80 KHz. Find R



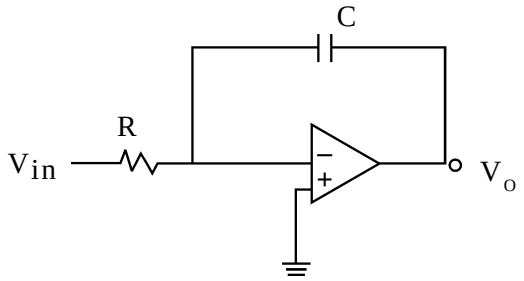
(1) 4.06 K (2) 8.12 K
(3) 16.24 K (4) 25 K

---

9. The frequency response of a causal and stable LTI system is $H(jw)=\frac{1-jw}{1+jw}$. The group delay of the system is

(1) $\frac{2}{1+w^2}$ (2) $\frac{-2}{1+w^2}$
(3) $2\tan^{-1}w$ (4) $-2\tan^{-1}w$

10. The circuit shown below is



(1) Voltage follower
(2) Inverter
(3) Differentiator
(4) Integrator

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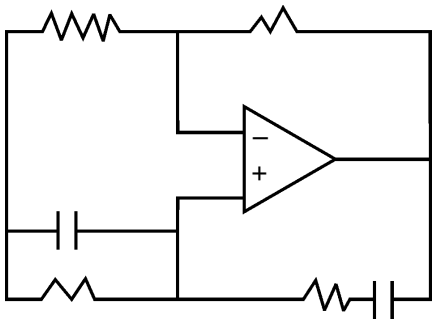
11. Identify the following circuit



(1) Colpitis oscillator
(2) Wien Bridge oscillator
(3) Phase shift oscillator
(4) Hartley oscillator

---

12. Which of the following Boolean Algebra statements is true?

(1) $(A+B).(\bar{A}+C).(B+C)=(A+B).(\bar{A}+C)$

(2) $AB+\bar{A}C+BC=AB+BC$

(3) $AB+\bar{A}C+BC=(A+B).(\bar{A}+C).(B+C)$

(4) $(A+B).(\bar{A}+C).(B+C)=AB+\bar{A}C$

---

13. A BJT with h_{FE} = 100 is operating with $I_B = 100\,\mu A$ and I_C = 5mA. The region in which the transistor is operating:

(1) Cutoff
(2) Active
(3) Saturation
(4) Can't be found

14. A implies B is written as
(1) $A \oplus B$ (2) $A + \overline{B}$ (3) $\overline{A} + B$ (4) $A\overline{B} + B$

15. A T-FF is
(1) An asynchronous JK FF with J = K = 1
(2) A synchronous JK FF with J = K = 1
(3) A synchronous RS FF with R = S = 1
(4) A D-FF with D = 1

16. A 1ms pulse can be widened into a 10 ms pulse by using
(1) An astable multivibrator (2) A monostable multivibrator
(3) A bistable multivibrator (4) A delay circuit

17. The minimum word length required for an ADC to produce at least 1000 levels is
(1) 8 (2) 9 (3) 10 (4) 11

18. A full adder can be made from two half adders and
(1) No other gate (2) A NOT gate
(3) An AND gate (4) An OR gate

19. Four memory chips of 16×4 size have their address buses connected together. The result is a memory of size
(1) 64×4 (2) 16×16 (3) 32×8 (4) 256×1

20. The number of unused states in a 4-bit Johnson counter is
(1) 2 (2) 4
(3) 8 (4) 12

21. Which of the following statements is FALSE for an array code?
(1) Reflection property (2) Unweighted code
(3) Self complementary code (4) Unit distance code

22. Which of the following ADCs is the fastest?
(1) Successive approximation
(2) Dual stope
(3) Counter or ramp
(4) Parallel comparator or weighted resistor

23. Which of the following is an error detecting and correcting code?

(1) Parity (2) Excess three

(3) Hamming (4) Gray

---

24. In standard TTL logic the "Totem Pole" stage is the name of the

(1) Multi-emitter input stage

(2) Middle stage

(3) Output stage with two transistors placed one above the other

(4) Output state with only one transistor and open collector

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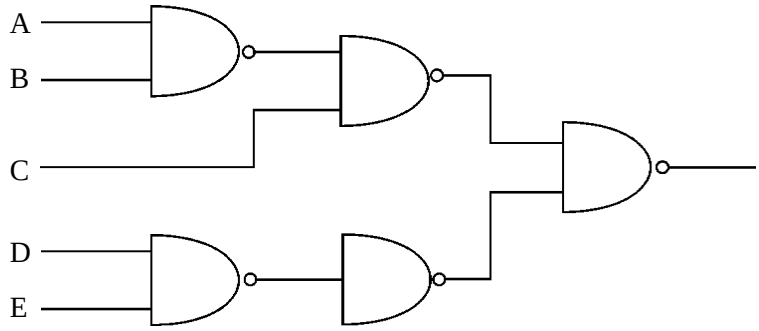
25. Which of the following functions will be realized by the given circuit?



(1) $\left(\bar{A}+\bar{B}\right)C+\overline{DE}$ (2) $\left(A+B\right)C+D+E$

(3) $AB+C+DE$ (4) $AB+C+\left(D+E\right)$

---

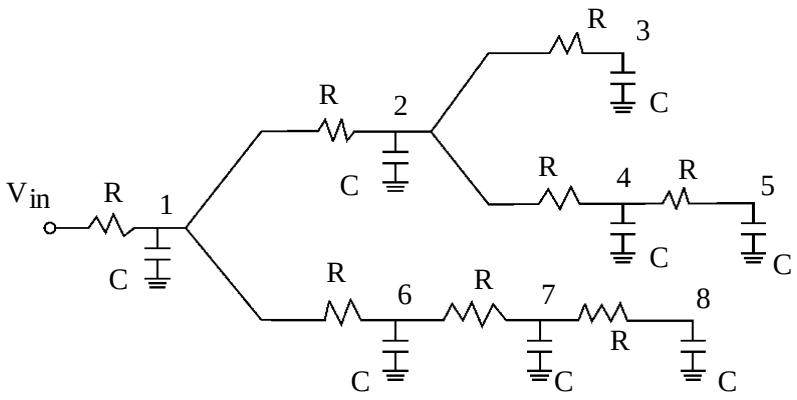
26. The Karnaugh Map shown below represents

B A / D C	00	01	11	10
00	1	1	1	
01		1	1	1
11		1	1	
10	1	1	1	

(1) $CA+\bar{C}A+\bar{D}CB\bar{A}+\bar{C}\bar{B}$ (2) $B+\bar{A}\bar{C}+B\bar{C}\bar{D}$

(3) $A+\bar{B}\bar{C}+BC\bar{D}$ (4) $A\bar{B}C+D$

27. Find Elmore Delay for the following circuit at mode 7.



(1) 7 RC
(2) 8 RC
(3) 13 RC
(4) 10 RC

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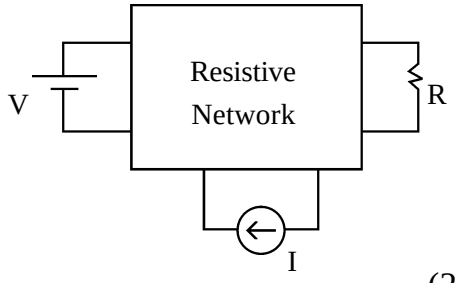
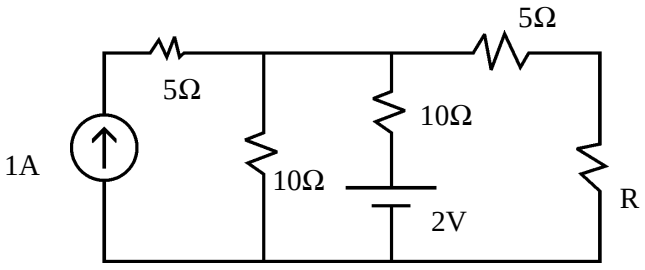
28. In the following circuit the power dissipated in R is 16 W when I is removed and 25 W when V is removed. What is the power when both V and I are present?



(1) 41 W
(2) 9 W
(3) 13 W
(4) 81 W

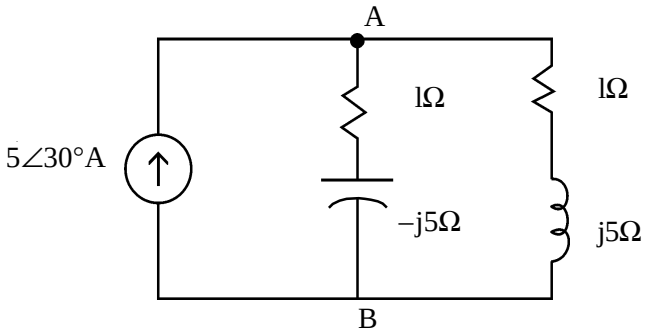
---

29. The value of R for maximum power transfer is



(1) 5 Ω
(2) 10 Ω
(3) 15 Ω
(4) 20 Ω

30.



Find V_{AB}

(1) $13\angle 30°$ (2) $65\angle 30°$

(3) $17\angle 0°$ (4) $13\angle -30°$

---

31. A superconducting material when placed in a magnetic field will
(1) Attract the magnetic field towards its center
(2) Attract the magnetic field but transfer it into a concentrated zone
(3) Repell all the magnetic lines of force passing through it
(4) Does not influence the magnetic field

---

32. In the case of ferromagnetic materials the spin moments associated with two set of atoms are aligned
(1) Parallel to each other (2) Anti parallel to each other
(3) Anti parallel but unequal magnitude (4) Randomly

---

33. Piezoelectric materials serve as a source of
(1) Micro waves (2) Ultrasonic waves
(3) Musical waves (4) Resonant waves

---

34. Insulating material used in spark plugs is
(1) Rubber (2) Porcelain
(3) Mica (4) Polystyrene

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35. Dielectric materials are used primarily for
(1) Insulation (2) Charge storage
(3) Reducing dielectric loss (4) Both insulation and charge storage

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36. At 0°K semiconductor acts as
(1) Super conductor (2) Good conductor
(3) An insulator (4) Same as semiconductor

37. Silicon doped with phosphorus is a
(1) Intrinsic semiconductor (2) Extrinsic semiconductor
(3) P-type semiconductor (4) N-type semiconductor

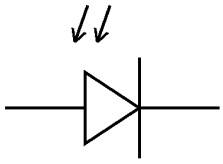
38. Phosphorescence refers to
(1) Optical absorption (2) Fluorescence
(3) Delayed fluorescence (4) Emission of light

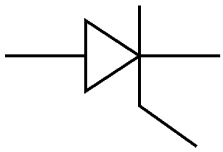
39. The structure of Quartz (SiO_2) is
(1) Hexagonal (2) Body centered cubic
(3) Face centered cubic (4) Orthorhombic

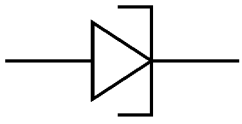
40. The IC chip used in computers and microprocessors are made of
(1) Pure Gold
(2) Pure silicon
(3) Pure silicon having desired impurities
(4) Ge having Si and as impurities

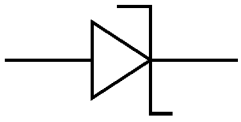
41. Above the curie temperature, a magnetic material becomes
(1) Ferromagnetic (2) Paramagnetic
(3) Diamagnetic (4) None of the above

42. Which of the following devices has the shortest turn off (reverse recovery) time?

(1) 

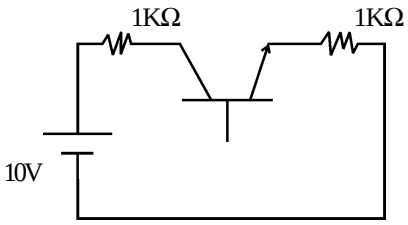
(2) 

(3) 

(4) 

43. In the following circuit, the transistor has V_{CE}(sat) = 0.2 V and β_{dc} = 24. What is the minimum base current needed to saturate the transistor?

(1) 0.200 mA
(2) 0.204 mA
(3) 0.208 mA
(4) None of the above



44. The current in a metal semiconductor diode is
(1) Zero at room temperature (2) Due to holes and electrons
(3) Due to holes alone (4) Due to electrons alone

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45. Any device having negative resistance is
(1) Suitable for current sharing
(2) Stable throughout its operating region
(3) Capable of switching at high frequency
(4) Suitable to be used in a relaxation oscillator

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46. Which of the following devices is a thyristor?
(1) UJT (2) Varactor Diode
(3) PUT (4) Thermistor

---

47. An SCR cannot turn on accidentally if it is subjected to
(1) High forward voltage (2) High gate pulse
(3) High dv/dt (4) High di/dt

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48. In the gate circuit of an SCR a pulse transformer and a _____ serve the same purpose of isolating power circuit from control circuit.
(1) UJT (2) diac (3) Opto coupler (4) Inductor

---

49. Which of the following is not connected to a Power Transistor?
(1) Large Base Current (2) Heat sink
(3) Small Base Current (4) DC Power Coupled to load as ac power

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50. The main disadvantage of a MOSFET over a BJT is that it
(1) Has a high input resistance
(2) Is a unipolar device
(3) Suffers from secondary breakdown
(4) Requires care in handling

---

51. A loss less transmission line has characteristic impedance Z_0 and capacitance per meter is C. What will be the velocity of a travelling wave on this line?
(1) Z_0C (2) $\frac{1}{Z_0C}$ (3) $\frac{Z_0}{C}$ (4) $\frac{C}{Z_0}$

52. For a cavity resonator with SWR = ρ, the ratio of loaded to unloaded Q is

(1) ρ (2) $\frac{\rho+1}{\rho}$ (3) $\frac{\rho}{\rho+1}$ (4) $\frac{1}{\rho}$

---

53. Which of the following statements is NOT TRUE for a strip line as compared to a wave-guide?
(1) It can be connected to semiconductor microwave devices directly
(2) It is much smaller
(3) Its bandwidth is smaller
(4) Its losses are smaller

---

54. A disadvantage of micro-strips is that they
(1) Do not lend themselves to printed circuit techniques
(2) Are more likely to radiate
(3) Are bulkier
(4) Are more expensive and complex to manufacture

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55. Why are wave-guides are operated above atmospheric pressure?
(1) To increase their power handling capacity
(2) To improve their wall conductivity
(3) To prevent propagation of higher order modes
(4) To change the wave impedance

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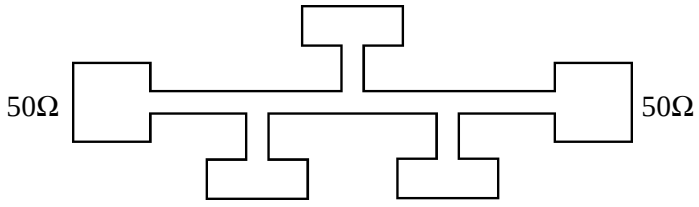
56. The following conductor pattern of a micro-strip line version of a microwave filter behaves as



(1) Band pass filter (2) High pass filter
(3) Low pass filter (4) Channel drop

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57. In a rectangular wave guide there is one halfwave variation of electric field across the narrower dimension and two halfwave variations across the wider dimensions. What is the dominant mode?
(1) TM_{12} (2) TE_{12}
(3) TE_{21} (4) TM_{21}

58. A paraboloidal reflector antenna has aperture number 0.25. What is its correct angular aperture?

(1) 45° (2) 90° (3) 120° (4) 180°

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59. Match the following

List I (Type of antenna)	List - II (Feature)
A) Helical	1) Circular polarization
B) Horn	2) Simplicity and compactness
C) Hoghorn	3) Low noise
D) Parabolic dish with horn feed	4) High directivity

Codes

	A	B	C	D
(1)	1	2	3	4
(2)	4	3	2	1
(3)	2	1	3	4
(4)	1	2	4	3

---

60. The effective height of a linear antenna of length l is *X* when current distribution along its length is uniform, and *y* when current distribution is sinusoidal. Then $\frac{X}{Y}$ = _____

(1) 2 (2) 1 (3) $\frac{4}{\pi}$ (4) $\frac{\pi}{4}$

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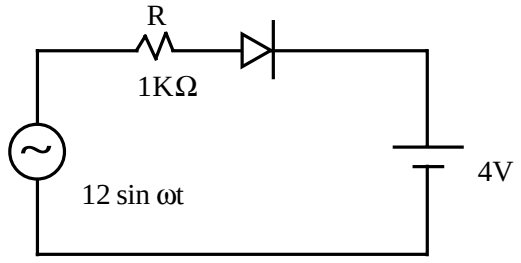
61. In the following circuit, Peak current through the resistor R assuming an ideal diode is _____

(1) 8 mA

(2) 12.8 mA

(3) 11.2 mA

(4) None



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62. Negative temperature coefficient of resistance in a power electronic device

(1) Enables parallel devices to share current properly

(2) Causes secondary breakdown

(3) Both 1 and 2

(4) Neither 1 nor 2

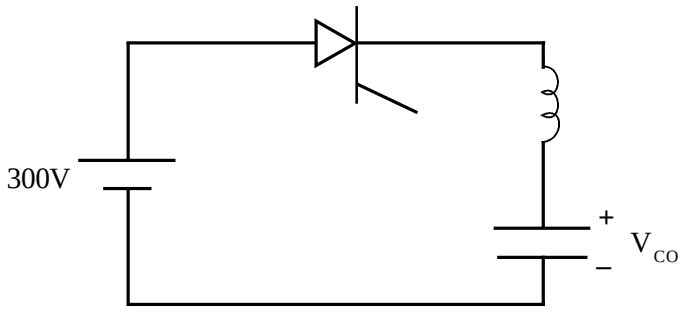
63. What is the peak current in the given circuit if L = 2 C and V_{CO} = 100 V? Neglect drop across SCR

(1) $\frac{200}{\sqrt{2}} A$

(2) $200\sqrt{2}\, A$

(3) $200\, A$

(4) $100\, A$



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64. A single phase voltage regulator feeds a $10\,\Omega$ resistor from a voltage source of 200 sinwt V. For $\alpha = 90°$ what is the power fed to the load?

(1) 0.5 KW (2) 0.75 KW (3) 1 KW (4) 2 KW

---

65. In multiple pulse modulation the amplitudes and frequencies of carrier and reference waves are respectively 6 V, 1.5 V, 6 KHz and 1 KHz. The number of pulses per half cycle and pulse width are

(1) 3, 45° (2) 6, 90° (3) 4, 60° (4) 3, 40°

---

66. In a 3-ϕ inverter with delta connection, triplen harmonics are absent. What are the frequencies present if fundamental is 50 Hz?

(1) 250, 350, 450, ... (2) 50, 250, 350, 450,...

(3) 50, 250, 350, 550,... (4) 50, 100, 200, 250

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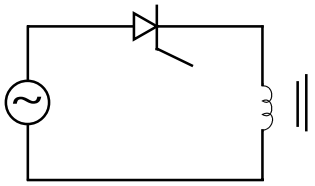
67. If the SCR in the circuit below is continuously gated what is the conduction angle?

(1) 96°

(2) 180°

(3) 270°

(4) 360°



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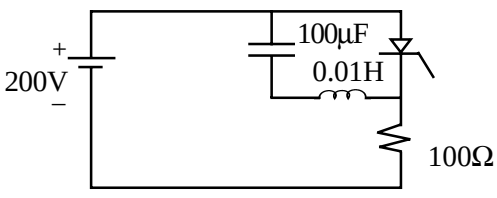
68. For the dc-dc converter shown, the peak SCR current is _____

(1) 2 A

(2) 22 A

(3) 40 A

(4) 42 A



69. $V_{dc} = \frac{3\sqrt{3}}{2\pi} Vm(1+\cos\alpha)$ $0 < \alpha < \frac{2\pi}{3}$ applies to which type of converter?

(1) 3ϕ Half Wave Controlled Rectifier (2) 3ϕ Semi Converter
(3) 3ϕ FULL Converter (4) 1ϕ FULL Converter

---

70. In a switched mode power supply under continuous conduction the average inductor voltage is
(1) Zero
(2) Fluctuating
(3) Constant and dependent on load
(4) Constant and dependent on switching frequency

---

71. Which of the following is NOT a part of a static VAR compensator
(1) Thyristor controlled reactor (2) Synchronous condenser
(3) Thyristor switched capacitor (4) Harmonic filter

---

72. Six step voltage waveform is obtained for any type of balanced load in the
(1) Phases of a 3ϕ 180° mode VSI (2) Lines of a 3ϕ 180° mode VSI
(3) Phases of a 3ϕ 120° mode VSI (4) Lines of a 3ϕ 120° mode VSI

---

73. Which of the following flags is needed to perform BCD addition in a Micro Processor?
(1) Parity (2) Carry (3) Overflow (4) Auxiliary carry

---

74. A register in a Micro Processor is
(1) A Flip Flog (2) A set of Flip Flops
(3) A set of memory locations (4) A single memory location

---

75. An interrupt causes the program to
(1) Jump to a specific location
(2) Call a specific subprogram
(3) Jump to an instruction whose address is on the stack
(4) Return to where it was executing previously

---

76. An NOP instruction is useful to
(1) Stop execution (2) Give control to external device
(3) Enter into a loop (4) Generate time delay

---

77. In most microprocessors, numbers are represented in
(1) Signed magnitude format (2) One's complement format
(3) Two's complement format (4) BCD code

78. The CPU places all the buses in tri state during
(1) HLT instruction (2) HOLD operation
(3) Lock instruction (4) INTR instruction

79. The communication between CPU and peripheral device before transfer of data is known as
(1) Handshaking (2) Interrupt
(3) DMA (4) Lock

80. Which of the following 8085 instructions clears the accumulator?
(1) ANA A (2) ORA A (3) XRA A (4) CMA

81. The microprocessor design based on separate program and data buses is called
(1) Boolean Architecture
(2) Von Neumann Architecture
(3) Princeton Architecture
(4) Harrand Architecture

82. Which of the following statements is FALSE?
(1) A ROM can be used as a look up table
(2) A ROM can be used to store a microprogram
(3) A ROM can be used to store partial products during multiplication
(4) A ROM can be used as a signal generator

83. The transfer function of a system is $\frac{10}{(1+S)}$. The steady state error to unit step input when operated as a unity feedback system is
(1) 10 (2) 0 (3) $\frac{1}{11}$ (4) Infinity

84. $G(S)=\frac{1+S}{S(1+0.5S)}$. The corresponding corner frequencies are
(1) 0 and 1 (2) 0 and 2 (3) 0 and –1 (4) 1 and 2

85. If the system has multiple poles on the jw-axis, the system is
(1) Stable (2) Unstable
(3) Marginally stable (4) Conditionally stable

86. Sinusoidal oscillations are
(1) Stable (2) Marginally stable
(3) Unstable (4) Conditionally stable

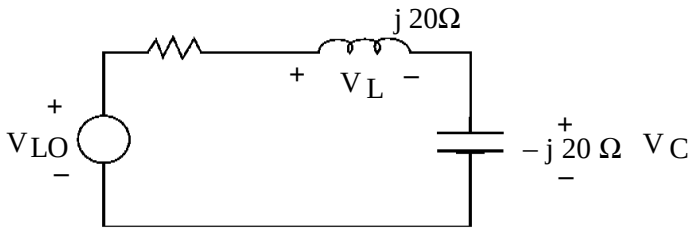
87. A lag network for compensations normally consists of
(1) R only (2) R and C elements
(3) R and L elements (4) R, L and C elements

88. The transfer function $\frac{1+0.5S}{1+S}$ represents a
(1) Lead network (2) Lag network
(3) Lag-lead network (4) Proportional controller

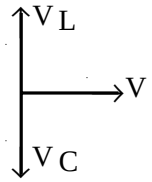
89. The characteristic equation of a unity feedback system is given by $S^3 + S^2 + 4S + 4 = 0$
(1) The system has one pole on the RH-s plane
(2) The system has no poles on the RH-s plane
(3) The system exhibits oscillatory behaviour
(4) Both (2) and (3)

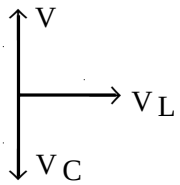
90. From the Nichol's chart, one can determine the following quantities pertaining to a closed loop system
(1) Magnitude and phase (2) Bandwidth
(3) Magnitude only (4) Both (1) and (2)

91.



Select the correct phasor diagram

(1)


(2)


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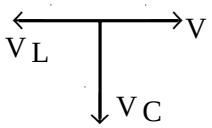

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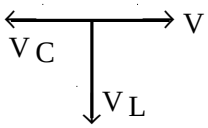


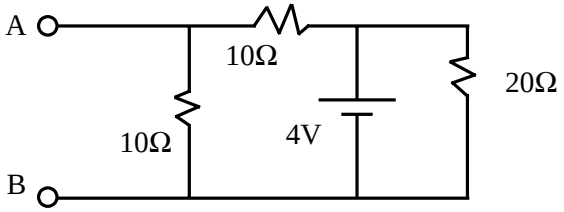
92. Thevenin's equivalent circuit for the following network is

(1) 5Ω, 4V

(2) 20Ω, 2V

(3) 5Ω, 2V

(4) 7.5Ω, 4V



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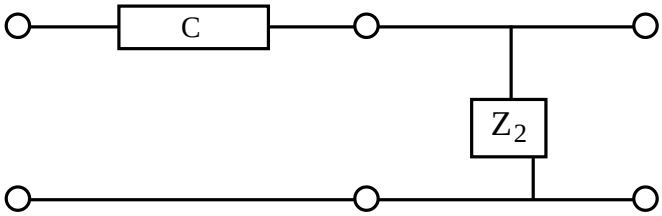
93. Two networks are connected in cascade. C parameter for the combination is $0.025\angle 45°$. Find Z_2



(1) $10\angle 30°\,\Omega$ (2) $40\angle -45°\,\Omega$

(3) 1Ω (4) 0Ω

---

94. Two identical 2-port networks with y-parameters $y_{11} = -y_{12} = -y_{21} = y_{22} = 1$ are cascaded. Then, for the cascade,

(1) $y_{11} = 1$ (2) $y_{12} = \frac{-1}{2}$ (3) $y_{21} = -2$ (4) $y_{22} = 1$

---

95. Which form of a network is obtained by continued fraction expansion of a reactance function about the origin?

(1) Foster - I (2) Foster - II

(3) Cauer - I (4) Cauer - II

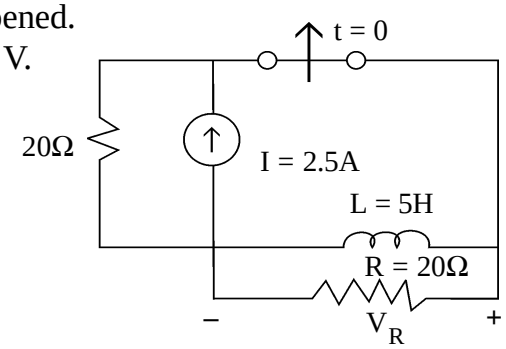
---

96. A network consists of linear resistors and ideal voltage sources. If values of all components are doubled then the voltage across each resistor

(1) Halves (2) Remains unchanged

(3) Doubles (4) Becomes 4 times

97. The switch is closed for a long time and suddenly opened. The voltage V_R will immediately jump to _____ V.



(1) 25 V

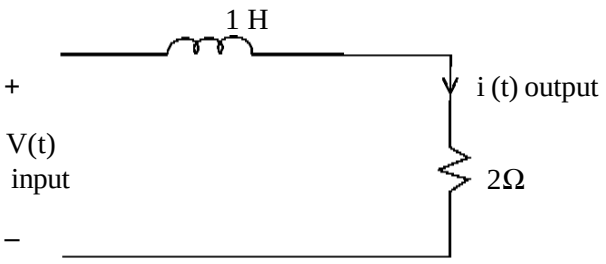
(2) 50 V

(3) –50 V

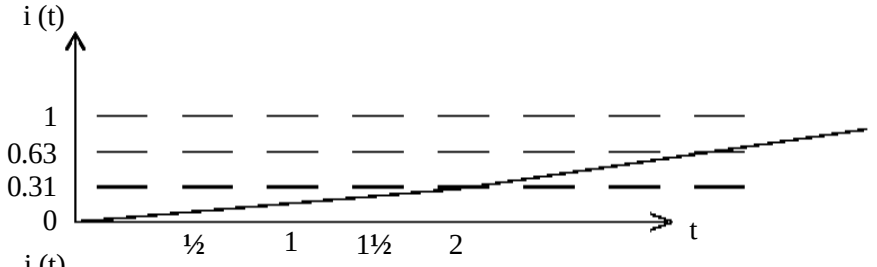
(4) 0 V

---

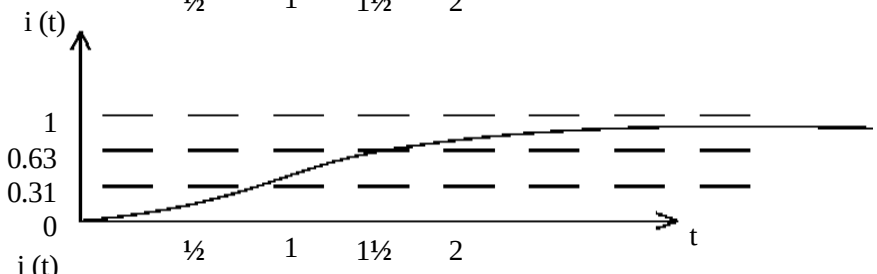
98. The step response of the following circuit is



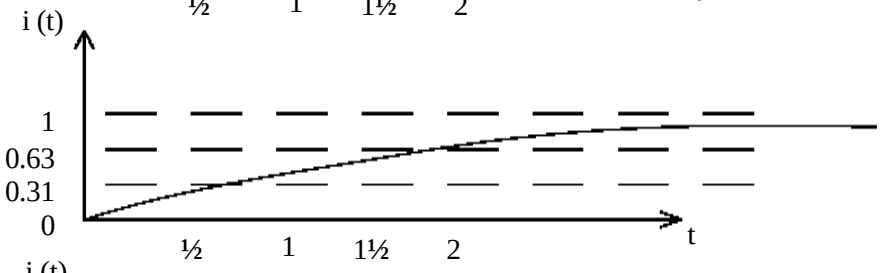
(1)



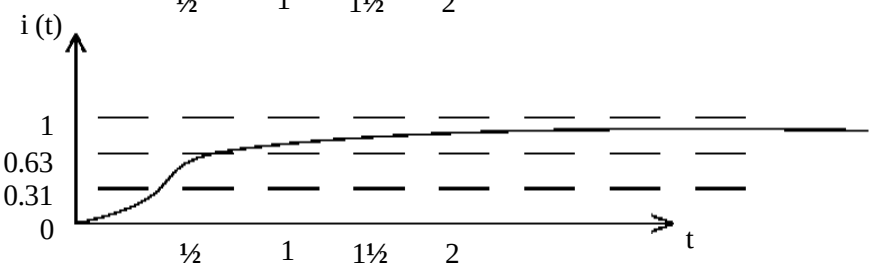
(2)



(3)



(4)



99. Which of the following equations indicates that magnetic monopoles do not exit in nature?
(1) $\vec{\nabla}\times\vec{E}=\vec{0}$ (2) $\vec{\nabla}\times\vec{B}=\vec{0}$
(3) $\vec{\nabla}.\vec{B}=0$ (4) $\vec{\nabla}.\vec{E}=0$

---

100. The impedance of a loss-less transmission line of length $\frac{\lambda}{4}$, short circuited at the other end is
(1) 0
(2) ∞
(3) Dependent on characteristic impedance
(4) Indeterminate

---

101. Indicate which of the following systems is digital modulation?
(1) Pulse position modulation (2) Pulse code modulation
(3) Pulse width modulation (4) Pulse frequency modulation

---

102. Which of the following is required to reduce the quantization noise
(1) Increase the number of standard amplitudes
(2) Send pulses whose sides are nearly vertical
(3) Use an RF amplifier in the receiver
(4) Increase the number of samples per second

---

103. Equalizers are used to
(1) Reduce noise (2) Amplify the signals
(3) Reduce phase distortion (4) Attenuate the signals

---

104. Approximately what is the frequency limit of the optical fiber?
(1) 20 GHz (2) 5 MHz (3) 100 MHz (4) 500 MHz

---

105. The core diameter of a single mode step index fiber is
(1) 200 μm (2) 100 μm
(3) 65 μm (4) 5 μm

---

106. Tropospheric scatter is used with frequencies in the following range
(1) HF (2) VHF (3) UHF (4) VLF

---

107. When microwave signals follow the curvature of the earth, thin is known as
(1) The faraday effect (2) Ducting
(3) Tropospheric scatter (4) Ionospheric reflection

108. Geostationary satellite
(1) Is motionless in space
(2) Orbits the earth with 24 hour period
(3) app stationary over the earth's magnetic pole
(4) Is located at a height of 36,000 km to ensure global coverage

---

109. Which of the following terms does not apply to the Yagi-Uda array
(1) Good bandwidth (2) Parasitic elements
(3) Folded dipole (4) High gain

---

110. Which of the following antennas is best excited by a waveguide?
(1) Horn antenna (2) Parabolic antenna
(3) Helical antenna (4) Dipole antenna

---

111. Which of the following is mobile GSM band frequency?
(1) 3 GHz (2) 2.4 GHz
(3) 1800 MHz (4) 600 MHz

---

112. Cassegrain feed is used with a parabolic reflector to
(1) Increase the grain of the system
(2) Increase the bandwidth of the system
(3) Reduce the size of the main reflector
(4) Allow the feed to be placed at a convenient point

---

113. Zoning is used with a lens antenna to
(1) Reduce the bulk of the lens
(2) Increase the bandwidth of the lens
(3) Permit pin-point focusing
(4) Correct the curvature of the wave front

---

114. A microwave tube oscillator that uses an axial magnetic field and a radial electric field is
(1) Reflex klystron (2) Magnetron
(3) BWO (4) Gyratron

---

115. The transferred electron bulk effect occurs in
(1) Germanium (2) Gallium Arsenide
(3) Silicon (4) Metal semiconductor junctions

---

116. Which of the following microwave tubes is called a slow wave structure
(1) Helix (2) Coupled cavity
(3) PPM focusing (4) Repeller

117. Negative resistance is obtained with a Gun diode because of
(1) Electron transfer to less mobile energy level
(2) Avalanche breakdown
(3) Tunneling across junction
(4) Electron domains at junction

---

118. A transmission system using two ground planes is
(1) Microstrip (2) Elliptical wave guide
(3) Parallel-wire line (4) Stripline

---

119. A waveguide has dimensions of a = 3 cm, b = 1.5 cm. The cut off wavelength for dominant mode is
(1) 8 cm (2) 1 cm (3) 6 cm (4) 3 cm

---

120. Which of the following components can be used to couple two microwave generators?
(1) Isolator (2) Circulator (3) E-plane T (4) Attenuator

---

121. The material used for maser amplifier is
(1) Silicon (2) Germanium
(3) Silica (4) Gallium Arsenide

---

122. Microwave link repeaters are typically 50 km apart
(1) Because of atmospheric attenuation
(2) Because of output tube power limitations
(3) Because of earth's curvature
(4) To ensure applied dc voltage is not excessive

---

123. The reason for the difference in the up-link and down-link frequencies in satellite communication is
(1) To avoid interference of uplink and downlink signals
(2) To save power
(3) To reduce cost
(4) To reduce errors

---

124. The videocamera signal output without sync is called
(1) Black burst (2) Generator lock video
(3) Composite video (4) Non-composite video

---

125. Which of the following camera tubes has minimum lag?
(1) Vidicon (2) Plumbicon
(3) Saticon (4) Iconoscope

126. If the camera can not be placed far away enough to include everything in the scene, the remedy is change the lens to one with a
(1) Lower 'f' rating (2) Higher 'f' rating
(3) Longer focal length (4) Shorter focal length

127. In gamma correction the _____ is stretched by the picture tube
(1) Black (2) Gray
(3) White (4) Red

128. What is the color of P1 screen phosphor
(1) Red (2) Blue
(3) White (4) Green

129. Pin cushion magnets are used in _____ picture tubes
(1) Monochrome (2) Color
(3) Both color and monochrome (4) Either color or monochrome

130. Given a 635 μs vertical retrace time, the number of complete horizontal lines scanned during vertical flyback is
(1) 10 (2) 20 (3) 30 (4) 60

131. The gain cross over frequency is the frequency at which the gain is
(1) Zero (2) Infinity
(3) One (4) Between zero and one

132. A lead compensating network
(1) Improves response time
(2) Increases resonant frequency
(3) Stabilizes the system with low phase margin
(4) Reduces the response time

133. The gain margin of a system is –10dB. It is increased by 5 dB. Then the system is
(1) Stable (2) Unstable
(3) Marginally stable (4) Unstable for –10dB itself

134. In the design of controllers, the advantage of pole-zero cancellation is
(1) The system order is reduced
(2) The system order is increased
(3) The cost of controller becomes low
(4) System's error is reduced to optimum levels

135. The commonly used material for thermocouples is
(1) Chromel copal (2) Chromel - alumel
(3) Platinum - rhodium (4) Nickel

136. A piezometer is used to measure
(1) Strain in structure (2) Very low pressures
(3) Very high pressures (4) Leakage reactance

137. The resolution of a digital ammeter with 4 digit display is
(1) $\frac{1}{10000}$ (2) $\frac{1}{1000}$ (3) $\frac{1}{4}$ (4) $\frac{1}{100}$

138. A VTVM has negligible loading effect on the circuit under measurement because
(1) It offers low input resistance (2) It has low current range
(3) It has high resistance range (4) It has high input impedance

139. A $4\frac{1}{2}$ digit voltmeter is used for voltage measurement. Its resolution will be
(1) 0.1% (2) 0.01%
(3) 0.001% (4) 0.0001%

140. A three digit 0-1 V digital voltmeter will have a resolution of
(1) 1 V (2) $\frac{1}{3}$ V (3) 0.1 V (4) 1 mV

141. A transducer that converts the input physical phenomenon into electrical output in the form of pulses is known as
(1) Secondary transducer (2) Tuned transducer
(3) Analogue transducer (4) Digital transducer

142. Which of the following devices cannot be used to measure pressure
(1) Manometer (2) LVDT
(3) Strain gauge (4) Bolometer

143. Half effect transducers are used for measuring
(1) Magnetic field (2) Current
(3) Electrical field (4) Pressure

144. An error that always follows the same definite mathematical or physical law is known as
(1) Systematic error (2) Mathematical error
(3) Physical error (4) Cumulative error

145. A digital voltmeter has a read out range from 0 to 9999 counts. The resolution of the instrument in volts when the full scale reading is 9.999 V, will be
(1) 0.01 mV (2) 0.1 mV (3) 1 mV (4) 1.1 mV

146. Which of the following method is suitable for the accurate measurement of temperature in negative and positive ranges?
(1) Wheatstone bridge (2) Resistance thermometer
(3) Wien's bridge (4) LDR

147. In a communications system, noise is most likely to affect the signal
(1) At the transmitter (2) In the channel
(3) In the information source (4) At the destination

148. Indicate the false statement. Modulation is used to
(1) Reduce the bandwidth used
(2) Separate differing transmission
(3) Ensure that the intelligence may be transmitted over longer distances
(4) Allow the use of practical antennas

149. Which of the following steps is the first in the process of reception of a digitally inodulated signal?
(1) Channel decoding (2) Source decoding
(3) De Modulation (4) Interpretation

150. 400 watt carrier is modulated to a depth of 75 percent using AM. The total power in the modulated wave
(1) 512.5 W (2) 200 W (3) 350 W (4) 450.6 W

151. In which of the following systems Doppler effect is not used
(1) CW Radar (2) FM Radar
(3) PPI display for plotting moving target (4) MTI radar

152. The Coho in MT1 radar operates at the
(1) Intermediate frequency (2) Transmitted frequency
(3) Received frequency (4) Pulse repetition frequency

153. The solution to the "blind speed" problem in a Radar is
(1) To change the Doffler frequency (2) To vary the PRF
(3) To use monopulse (4) To use MTI

154. What is the Doppler shift produced by a target whose radial velocity is 100 km/hr as seen by a CW radar operating at 5 GHz?
(1) 2 KHz (2) 927 Hz
(3) 1025 Hz (4) 850 Hz

155. ILS is a
(1) Air navigation system (2) Water navigation system
(3) Surface navigation system (4) Ship navigation system

156. In synchronous TDM, for 'n' signal sources of the same data rate, each frame contains _____ slots
(1) n + 1 (2) n – 1 (3) 0 to n (4) n

157. Which of the following multiplexing techniques is specific to optical communication?
(1) TDM (2) FDM
(3) WDM (4) OFDM

158. FDM is _____ technique
(1) Digital (2) Analog
(3) Both Analog and Digital (4) Neither Analog nor Digital

159. In a multiplexed system _____ lines share the bandwidth of _____ link
(1) 1; n (2) n; 1 (3) 1; 1 (4) n; n

160. _____ is the technique that allows the simultaneous transmission of multiple signals across a single data link
(1) Demodulating (2) Multiplexing
(3) Compressing (4) Demultiplexing

161. Which of the following techniques expand the bandwidth of a signal by replacing each data bit with 'n' bits
(1) DSSS (2) FHSS (3) FDM (4) TDM

162. Which of the techniques divides the available bandwidth into number of frequency bands
(1) TDMA (2) CDMA
(3) FDMA (4) TDM

163. _____ can be achieved by using multiplexing, _____ can be achieved by using spreading
(1) Privacy and antijamming; efficiency
(2) Privacy and efficiency; antijamming
(3) Efficiency; privacy and antijamming
(4) Efficiency and antijamming; privacy

164. _____ TDM, each input connection has an allotment in the output, even if it is not sending data
(1) Isochronous (2) Statistical
(3) Synchronous (4) Uniform

165. A local telephone network is an example of a _____ network
(1) Packet-switched (2) Message-switched
(3) Circuit-switched (4) Store and forward

166. Data from a computer are _____; the local loop handles _____ signals
(1) Analog; digital (2) Digital; analog
(3) Digital; digital (4) Analog; analog

167. The protocol that is used for signalling in the telephone network is called
(1) SSS (2) SS7 (3) POP (4) PSTN

168. In TDM, the transmission of the multiplexed path is usually _____ the sum of the transmission rates of the signal sources
(1) Equal to (2) Less than
(3) Greater than (4) Not related to

169. Which digital multiplexing technique combines several low bit rate channels to high rate one
(1) TDM (2) FDM (3) WDM (4) FDMA

170. In which of the techniques the sequence are generated by using special tables or matrices
(1) TDMA (2) CDMA (3) FDMA (4) FHSS

171. What is the octal equivalent of decimal 225_{10}?
(1) 342_8 (2) 341_8 (3) 343_8 (4) 344_8

172. Which data structure is useful for evaluation of postfix expressions?
(1) Tree (2) Linked list (3) Stack (4) Queue

173. Maximum number of nodes in a complete binary tree of height h is:
(1) 2^h (2) $2^{h+1} - 1$ (3) 2^{h-1} (4) $2^h + 1$

174. In a Computer, Microprogram is stored in _____
(1) Hard disk (2) RAM
(3) ROM (4) Control Memory

175. Among the following which is a universal gate?
(1) AND (2) NAND (3) XOR (4) OR

176. Execution of an instruction with invalid opcode causes the following:
(1) Internal interrupt (2) External interrupt
(3) Software interrupt (4) Data transfer

177. Baud rate is used to define:
(1) Number of bits transferred serially per second
(2) Number of bytes transferred serially per second
(3) Number of bits transferred parallelly per second
(4) Number of bytes transferred parallelly per second

178. DMA is useful for
(1) Fast memory copying (2) Fast input to output copying
(3) Fast I/O to and from memory (4) Read / Write operation

179. What is MBR?
(1) First sector of active partition (2) First sector of Primary partition
(3) First sector of extended partition (4) First sector of hard disk

180. What is the protocol used for web page transfer?
(1) HTML (2) XML
(3) HTTP (4) Apache

181. Which SQL command is useful for modifying an existing tuple of a database table?
(1) Update (2) Select
(3) Create (4) Insert

182. How many layers are there in OSI network reference model?
(1) 5 (2) 6 (3) 7 (4) 8

183. Which Unix command is used for taking backup of a system?
(1) cpio (2) cp (3) zip (4) compress

184. Encapsulation is provided in C++ language by which of the following feature:
(1) Class (2) Inheritance
(3) Polymorphism (4) Array

185. Windows application iteratively processes user/system generated events in the form of _____
(1) Handles (2) Messages
(3) Actions (4) Menu commands

186. The number of lines scanned per frame in the raster on the picture tube screen is
(1) 525 (2) 262
(3) 20 (4) 10

187. The width of a vertical sync pulse with its narrations includes the time of
(1) Six half lines or three lines (2) Five lines
(3) Three half lines (4) Five half lines

188. The color with most luminance is
(1) Red (2) Yellow
(3) Green (4) Blue

189. Which signal can be used for both recording and playback?
(1) CED (2) VHD
(3) Laser disk (4) VHS

190. How many TV fields are recorded on one slant track of a tape?
(1) 1 (2) 2 (3) 4 (4) 60

191. A comb filter is used to
(1) Cancel chrome crosstalk (2) Separate white from black
(3) Clip the sync from blanking (4) Separate ac and dc

192. In all the standard TV broadcast channels, the difference between the picture and sound carrier frequencies is
(1) 0.25 MHz (2) 1.25 MHz
(3) 4.5 MHz (4) 6 MHz

193. In a TV, the contrast control is in the
(1) Chroma amplifier (2) Color killer
(3) T video amplifier (4) Delay line

194. What is the duty cycle of a radar with pulse width of $3\mu s$ and a pulse repetition time of 6 ms?
(1) 0.005 (2) 0.0005
(3) 0.055 (4) 0.5

195. If the peak power of radar system is increased by 16 times, the maximum range will be increased by a factor by
(1) 2 (2) 4 (3) 8 (4) 16

196. The IF Bandwidth of a radar receiver in inversely proportional to the
(1) Pulse width (2) Pulse reflection frequency
(3) Pulse interval (4) Square root of peak power

197. If a return echo arrives after the allocated pulse interval
(1) It will interfere with the operation of transmitter
(2) The receiver might be overloaded
(3) It will not be received
(4) The target will appear closer than it really is

198. After a target has been acquired, the best scanning system for tracking is
(1) Nodding (2) Spiral
(3) Conical (4) Helical

199. If the target cross section is changing, the best system for accurate tracking is
(1) Lobe switching (2) Sequential lobbing
(3) Conical scanning (4) Monopules

200. The biggest disadvantage of CW Doppler radar is that
(1) It does not give the target velocity
(2) It does not give the target range
(3) A transponder is required at the target
(4) It does not give the target position

SPACE FOR ROUGH WORK