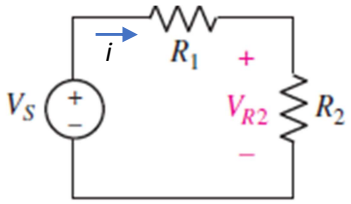
1. A new type of device appears to accumulate charge according to the expression $q(t)=(15t^2 - 12t)$ mC (t in s) in the interval of $0 \leq t < 5$ s, at what time does the current flowing into the device equal zero?
   A. 0.8s
   B. 0.4s
   C. 0.475s
   D. 0.2ms

Answer: B

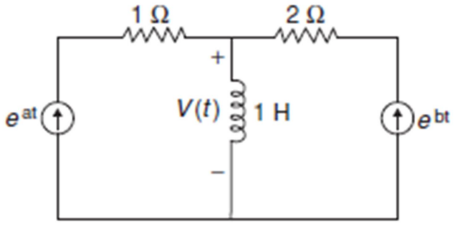
2. Which of the following is not true regarding to the following circuit shown below.



   A. $V_s = i(R_1 + R_2)$
   B. $V_{R2} = V_s(\frac{R2}{R1 + R2})$
   C. $V_{R2} = V_s(\frac{R1}{R1 + R2})$
   D. $i = (\frac{Vs}{R1 + R2})$

Answer: C

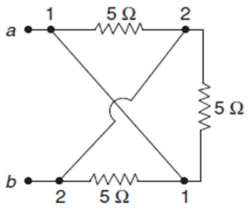
3. In the circuit given below, the voltage V(t) is given by



   A. $e^{at} - e^{bt}$
   B. $e^{at} + e^{bt}$
   C. $a.e^{at} - b.e^{bt}$
   D. $a.e^{at} + b.e^{bt}$

Answer: D

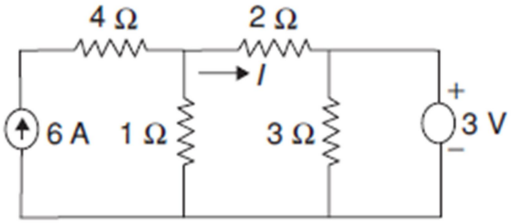
4. Consider the circuit shown in figure below and determine R_{ab},



A. 2.5 Ω
B. 7.5 Ω
C. 25 Ω
D. 1.66 Ω

Answer: D

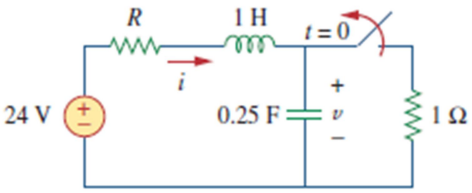
5. For the circuit shown in the figure the current 'I' is given by



A. 2 A
B. 3 A
C. 1 A
D. zero

Answer: C

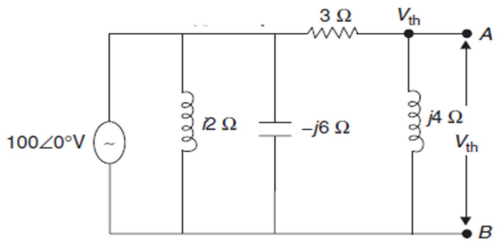
6. The switch is the circuit below is closed for long time and opened at t = 0. What is the value of v (capacitor voltage) at steady state?



A. 1V
B. 24V
C. 0V
D. 6V

Answer: B

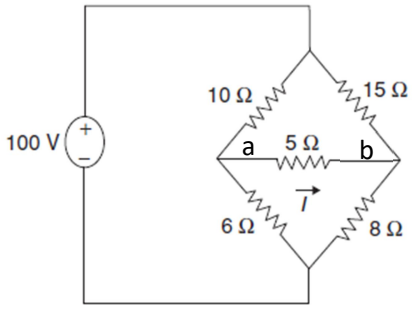
7. The Thevenin's equivalent voltage Vth across the terminal A and B of the network shown in the figure is given by



A. (64+48j)V
B. (48j – 64)V
C. (48 + 64j)V
D. (48 - 64j)V

Answer: A

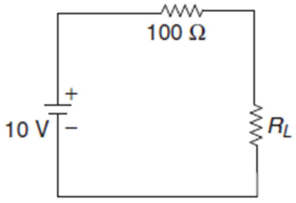
8. What is the Thevenin equivalent resistance at terminal **a** and b on 5Ω indicated on the circuit given below



A. 9.44Ω
B. 39Ω
C. 8.97Ω
D. 9Ω

Answer: C

9. The maximum power that can be transferred to the load resistor RL from the voltage source in the figure is



A. 1 W
B. 10 W
C. 0.25 W
D. 0.5 W

Answer: C

10. What happens if the following program is executed in C and C++?

```
#include<stdio.h>
int main(void)
{
        int new = 5;
        printf("%d", new);
}
```

A. Error in C and successful execution in C++
B. Error in both C and C++
C. Error in C++ and successful execution in C
D. A successful run in both C and C++

Answer C

11. Which of the following is the correct identifier?
A. $var_name
B. VAR_123
C. varname@
D. 2come

Answer B

12. Which of the following statements is correct about the formal parameters in C++?
A. Parameters with which functions are called
B. Parameters which are used in the definition of the function
C. Variables other than passed parameters in a function
D. Variables that are never used in the function

Answer A

13. What will be the output of the following C++ code?

```
#include <stdio.h>
#include <iostream>
using namespace std;
 int main()
{
        int array[] = {10, 20, 30};
      cout << -2[array];
      return 0;
}
```

A. -15
B. -30
C. compile time error
D. garbage value

Answer B

14. What will be the output of the following C++ code?

```
#include <iostream>
using namespace std;
int main()
{
        int a = 3, b =4;
       cout << a | b;
       return 0;
}
```

A. 3
B. 4
C. 7
D. 8

Answer C

15. For inserting a new line in C++ program, which one of the following statements can be used?

A. \n
B. \r
C. \a
D. \t

Answer A

16. Which of the following gives the 4th element of the array?
A. Array;
B. array[0];
C. array[3];
D. array[4];

Answer C

17. What is the output of below program?

```
int main()
{
        int a = 10;
        cout<<a++;
        return 0;
}
```

A. 10
B. 11
C. 12
D. 9

Answer A

18. A zener diode is always connected in
    A. Reverse bias
    B. Forward bias
    C. either reverse or forward bias
    D. none of the above

Answer: A

19. Which type of rectifier required transformer to operate
    A. half-wave rectifier
    B. center-tap full-wave rectifier
    C. bridge full-wave rectifier
    D. none of the above

Answer: B

20. A Bipolar junction transistor is acted as
    A. Current controlled device
    B. voltage controlled device
    C. both voltage and current operated device
    D. none of the above

Answer: A

21. A transistor is connected in CB mode. If it is not connected in CE mode with same bias voltages, the values of base, collector and emitter current will
    A. remain the same
    B. increase
    C. decrease
    D. none of the above

Answer: A

22. Main function of common-collector stage is to
    A. provide voltage gain
    B. provide phase inversion
    C. provide a high-frequency path to improve the frequency response
    D. buffer the voltage amplifiers from the low-resistance load and provide impedance matching for maximum power transfer

Answer: D

23. A silicon transistor is biased with base resistor method. If values of β=100, VBE =0.7 V, zero signal collector current IC = 1 mA and VCC = 6V , what is the value of the base resistor ?
    A. 105 kΩ
    B. 530 kΩ
    C. 315 kΩ
    D. None of the above

Answer: B

24. The purpose of capacitors in a transistor amplifier is to

A. Protect the transistor

B. Cool the transistor

C. Couple or bypass a.c. component

D. Provide biasing

Answer: C

25. The best frequency response of amplifier is achieved using

A. RC coupling
B. Transformer coupling
C. Direct coupling
D. None of the above

Answer: C

26. Why the number of stages that can be directly coupled is limited

A. Due to changes in temperature cause thermal instability
B. Circuit becomes heavy and costly
C. It becomes difficult to bias the circuit
D. None of the above

Answer : A

27. The period of signal of x(t) = $\sin t + \cos \sqrt{2}t$ is

A. $\pi/\sqrt{2}$
B. 3π
C. 2π
D. The signal is not periodic

Answer: D

28. The even part of a signal $x(n) = u(n) + u(-n)$ is

A. $u(n) - u(-n)$
B. $u(n) + u(-n)$
C. $u(-n) - u(n)$
D. $2u(n)$

Answer: B

29. The Impulse response of a LTI system is given as **h(n)=** $\left(\frac{-1}{4}\right)^n \boldsymbol{u(n)}$ .The step response is

A. $\frac{1}{4}\left[5+\left(\frac{-1}{4}\right)^n\right]$
B. $\frac{1}{4}\left[5-\left(\frac{-1}{4}\right)^n\right]$
C. $\frac{1}{4}\left[4+\left(\frac{-1}{4}\right)^n\right]$
D. $\frac{1}{4}\left[4-\left(\frac{-1}{4}\right)^n\right]$

Answer: B

30. H(s) the transfer function and H(s)= $\frac{s}{s^2-s-2}$ $(\boldsymbol{\sigma < -1})$**.** Then the function is

A. Causal and stable
B. Causal and unstable
C. Non-causal and stable
D. Non-causal and unstable

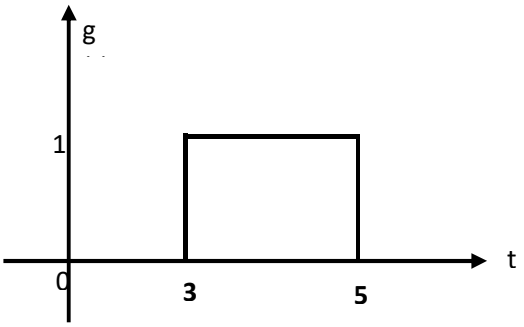
Answer: D

31. Unit impulse response of a system is $\boldsymbol{f(t) = e^{-t}}$**,** ***for*** $\boldsymbol{t \geq 0}$, for this system, the steady state value of the output for unit step input is equal to

A. 1
B. –1
C. 0
D. ∞

Answer: A

32. The Laplace transform of the following signal given in the following figure is equal to:



A. $\frac{1}{s}(e^{3s}-e^{5s})$
B. $\frac{1}{s}(e^{-5s}-e^{-3s})$
C. $\frac{1}{s}(e^{3s}-e^{5s})$
D. $\frac{e^{-3s}}{s}(e^{5s}-e^{3s})$

Answer: D

33. $x[n] = a^n u[n]$ where a is real. z-transform of $x[n]$ is

A. $\frac{z}{z-a}$, $|z| < |a|$
B. $\frac{z}{z-a}$, $|z| > |a|$
C. $\frac{z}{z+a}$, $|z| > |a|$
D. $\frac{z}{z+a}$, $|z| < |a|$

Answer: B

34. Which of the following statements is/are true?
1. A Fourier series for an even periodic function will consist entirely of cosine terms.
2. A Fourier series for an odd periodic function will consist entirely of sine terms.
3. A Fourier series for an odd periodic function will consist entirely of cosine terms.
4. A Fourier series for an even periodic function will consist entirely of sine terms.

A. 3, 4
B. 1, 2
C. 1, 3
D. 2, 4

Answer: B

35. If the driving point admittance function of a 1-port network is $Y(s) = \frac{Ks}{s+\alpha}$,it can be realized using
A. Parallel combination of R, L
B. Series combination of R, L
C. Parallel combination of R, C
D. Series combination of R, C

Answer D

36. For an RC driving point impedance function, the poles and zeros
A. Should alternate only on the negative real axis
B. Should alternate on the imaginary axis
C. Should alternate on real axis
D. Can lie anywhere on the left half plane

Answer A

37. An ideal filter should have
A. Zero attenuation in the attenuation band
B. Zero attenuation in the pass band
C. Infinite attenuation in the passband
D. None of the above

Answer B

38. If two two-port networks are connected in parallel, and if the port current requirement is satisfied, which one of the following is true
    A. The ABCD-parameter matrices add
    B. The z -parameter matrices add
    C. The y-parameter matrices add
    D. None of the above

Answer C

39. Match the List-I (Forms) with List-II (Networks)

	List I		List II
a	Cauer I	1	L in series arms and C in shunt arms of a ladder
b	Cauer II	2	C in series arms and L in shunt arms of a ladder
c	Foster I	3	series combination of L and C in parallel
d	Foster II	4	Parallel combination of L and C in series

    A. a-1, b-2, c-3, d-4
    B. a-1, b-2, c-4, d-3
    C. a-2, b-1, c-4, d-3
    D. a-2, b-1, c-3, d-4

Answer A

40. A two-port network is described by relations

$$V_1 = 2V_2 + 0.5I_2$$
$$I_1 = 2V_2 + I_2$$

What is the value of the h_{22} parameter of the network

    A. 2 Ω
    B. 2 mho
    C. -2Ω
    D. -2 mho

Answer D

41. Ideal response of filter takes place in
    A. Pass band and stop band frequency
    B. Stop band frequency
    C. Pass band frequency
    D. None of the mentioned

Answer C

42. A network function can be completely specified by
    A. Poles and zeros
    B. Real parts of zeros
    C. Real parts of poles
    D. Poles, zeros, and a scale factor

Answer D

43. A device that is used to switch one of several input lines to a single output line is called a
    A. Comparator
    B. Multiplexer
    C. Decoder
    D. Encoder

Answer C

44. If the period of a clock signal is 500 ps, the frequency is_____

    A. 20 MHz
    B. 2 GHz
    C. 200 MHz
    D. 20 GHz

Answer B

45. In the binary number 1000, the weight of the column with the 1 is

    A. 8
    B. 10
    C. 6
    D. 4

Answer A

46. 2's complement of binary number 0101 is

    A. 1111
    B. 1011
    C. 1101
    D. 1110

Answer B

47. _____ is a universal gate

A. AND
B. OR
C. NOT
D. NAND

Answer D

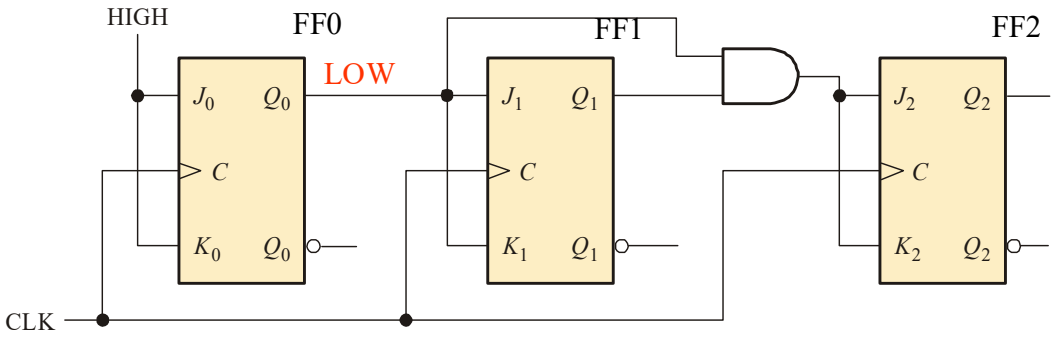
48. A Boolean expression that is in standard SOP/POS form is

A. The minimum logic expression
B. Contains only one product term
C. Has every variable in the domain in every term
D. None of the above

Answer C

49. Assume Q_0 is LOW. The next clock pulse will cause

a. FF1 and FF2 to both toggle
b. FF1 and FF2 to both latch
c. FF1 to latch; FF2 to toggle
d. FF1 to toggle; FF2 to latch



Answer B

50. A 4-bit parallel-in/parallel-out shift register will store data for

A. 1 clock period
B. 3 clock periods
C. 2 clock periods
D. clock period

Answer A

51. Terminators are used in _____ topology
    A. Bus
    B. Ring
    C. Star
    D. Mesh

Answer A

52. The layer the decides the physical path of the data
    A. Physical layer
    B. Datalink Layer
    C. Network Layer
    D. Transport Layer

Answer C

53. _____ defines how a particular pattern to be interpreted, and what action is to be taken based on that interpretation
    A. Syntax
    B. Timing
    C. Logistics
    D. Semantics

Answer D

54. Which among the following is true about transport layer?
    A. It provides Recovery from packet losses
    B. It ensure End to end connectivity
    C. It detects duplicate packets
    D. It ensures the Packet delivery in the correct order

Answer B

55. What is the major factor that makes coaxial cable less susceptible to noise than twisted pair cable?
    A. Outer conductor
    B. Inner conductor
    C. Diameter of cable
    D. Insulating material

Answer A

56. When a packet with the code is transmitted, it is received and processed by every machine on the network. This mode of operation is called……

A. Unicasting
B. Point to Point
C. Multicasting
D. Broadcasting

Answer D

57. Frequency of failure and network recovery time after a failure are measure of the __of a network.

A. Security
B. Reliability
C. Performance
D. Feasibility

Answer B

58. Which error detection method consists of one redundant bit per data unit?

A. CRC
B. Checksum
C. Simple parity check
D. Two dimensional parity check

Answer C

59. Which one of the following is not true?

A. Increasing the modulating signal frequency will increase the transmission bandwidth
B. Quantization noise will increase if the quantization level is increased
C. Aliasing is the effect of under sampling
D. Pulse length modulation is one type of pulse time modulation

Answer B

60. In PCM system each quantization levels are encoded in to 5 bits. The signal to quantization noise ratio is

A. 6 dB
B. 32 dB
C. 48 dB
D. 36 dB

Answer B

61. Consider an angle modulated signal $x(t) = 8cos[2\pi \times 10^6 t + 2sin(8000\pi t) + 4cos(8000\pi t)]$ V. The average power of $x(t)$ is.

A. 6 W
B. 72kW
C. 32 W
D. 144 W

Answer C

62. Any modulation process produces
A. amplification
B. sidebands
C. noise
D. carriers

Answer D

63. The minimum sampling frequency (in samples/sec) required to reconstruct the following signal from its samples without distortion $M(t) = 10sinc(2000t) + 2sinc^2(2000t)$ would be
A. 2000
B. 4000
C. 6000
D. 8000

Answer B

64. The higher the modulation index in FM
A. The greater the number of sidebands and the wider the bandwidth
B. The fewer the number of sidebands and the wider the bandwidth
C. The greater the number of sidebands and the narrower the bandwidth
D. The fewer the number of sidebands and the narrower the bandwidth

Answer A

65. A 1 MHz sinusoidal carrier is amplitude modulated by a symmetrical square wave of period 1000 μsec. Which of the following frequencies will not be present in the modulated signal?
A. 999 kHz
B. 1001 kHz
C. 1020 kHz
D. all

Answer C

66. A balanced modulator eliminates which of the following from its output?
    A. Upper sideband
    B. Lower sideband
    C. Carrier
    D. One of the sidebands

Answer C

67. One of the following is efficient modulation technique
    A. Pulse Length Modulation
    B. Pulse Width Modulation
    C. Pulse Amplitude Modulation
    D. Pulse Position Modulation

Answer D

68. The output SNR can be made independent of input signal level by using
    A. Uniform quantizer
    B. Non uniform quantizer
    C. Uniform & Non-uniform quantizer
    D. None of the mentioned

Answer B

69. Which type of quantization is most preferable for audio signals for a human ear?
    A. Uniform quantization
    B. Non uniform quantization
    C. Uniform & Non-uniform quantization
    D. None of the mentioned

Answer B

70. When pulse code modulation is applied to non-binary symbols we obtain waveform called as
    A. PCM
    B. PAM
    C. M-array
    D. line codes

Answer C

71. The return to zero waveform consists of
    A. Unipolar RZ
    B. Bipolar RZ
    C. RZ-AMI
    D. All of the mentioned

Answer D

72. In which waveform logic 1 is represented by half bit wide pulse and logic 0 is represented by absence of pulse?
    A. Unipolar RZ
    B. Bipolar RZ
    C. RZ-AMI
    D. Manchester coding

Answer A

73. In M-array PPM waveform, modulation is effected by
    A. Delaying
    B. Advancing
    C. Delaying & Advancing
    D. None of the mentioned

Answer C

74. For both PPM and PDM _____ is kept constant.
    A. Amplitude
    B. Time period
    C. Frequency
    D. Number of levels

Answer A

75. The method in which small amount of controlled ISI is introduced into the data stream rather than trying to eliminate it completely is called as
    A. Correlative coding
    B. Duo-binary signaling
    C. Partial response signaling
    D. All of the mentioned

Answer D

76. In precoding technique, the binary sequence is _____ with the previous pre-coded bit.
    A. And-ed
    B. Or-ed
    C. EXOR-ed
    D. Added

Answer C

77. Among the following one is not multiple access technique?
    A. SDMA
    B. TDMA
    C. NOMA
    D. OFDM

Answer: D

78. There are different models used to characterize wireless channel behaviors. Among these different models which one is employed to model the channel characteristics in cellular communication system?
    A. AWGN
    B. Rayleigh Fading
    C. Nakagami Fading
    D. Racian fading

Answer: B

79. Which of the following is not a multipath channel parameter that can be determined from the power delay profile?
    A. RMS delay spread
    B. Doppler spread
    C. Mean excess delay
    D. Excess delay spread

Answer: B

80. One of the following channels is **not** termed a narrow-band channel
    A. Frequency selective fading
    B. Flat fading
    C. Amplitude-varying channels
    D. None

Answer: A

81. The type of Access technology which can enhance the battery life is
    A. CDMA
    B. TDMA
    C. OFDMA
    D. None of the above

Answer: A

82. Which of the following technology distributes the coverage of the cell and extends the cell boundary to hard-to-reach places?
    A. Sectoring
    B. Cell splitting
    C. Micro cell zone concept
    D. Scattering

Answer: C

83. Grade of service refers to
    A. Accommodating a large number of users in a limited spectrum
    B. Ability of a user to access the trunked system during busy hour
    C. Two calls in progress in nearby mobile stations
    D. High-speed users with a large coverage area

Answer: C

84. Which one is true for path loss fading in large-scale path loss model in line-of -sight communication system?
    A. As the path distance increases the attenuation decreases
    B. The path loss increases as the wavelength of the system decreases keeping the path distance constant
    C. As the path distance increases by two times the path loss also decreases by two times
    D. The path loss value has nothing to do with the frequency of operation

Answer: B

85. The cut-off frequency of TEM wave is
    A. Zero
    B. 11.0 GHz
    C. 66GHZ
    D. ∞

Answer A

86. A unidirectional device often made up of ferrite material used in conjunction with a channel-combining network to prevent the output from interfering with the output of another transmitter is
    A. Circulator
    B. Isolator
    C. Magi Tee
    D. Rat race

Answer B

87. A PIN diode can be used in either a series or a shunt configuration to form a _____
    A. Single pole single throw switch
    B. Single pole double throw switch
    C. Amplifier
    D. Oscillator

Answer A

88. Varactor diode is a semiconductor diode in which the _____ can be varied as a function of reverse voltage of the diode
    A. Junction resistance
    B. Junction inductance
    C. Junction capacitance
    D. Junction impedance

Answer C

89. When a reverse bias voltage exceeding the breakdown voltage is applied to an IMPATT diode, it results in:
    A. Avalanche multiplication
    B. Break down of depletion region
    C. High reverse saturation current
    D. Avalanche breakdown

Answer A

90. Which of the following devices a slow wave structures?
    A. Reflex klystron
    B. Klystron two cavity amplifier
    C. Klystron multi cavity amplifier
    D. TWT

Answer D

91. Which of the following devices cannot be used as microwave oscillator
    A. TRAPATT
    B. IMPATT
    C. BARITT
    D. PN junction

Answer D

92. The kind of wave energy is transformed into plane waves in lens antenna is
    A. Convergent
    B. Divergent
    C. Contingent
    D. Congruent

Answer B

93. The electric field E and the magnetic field H of a short dipole antenna satisfy the condition
    A. The r component of E is equal to zero
    B. Both r and θ components of H are equal to zero
    C. The θ component of E dominates the r component in the far field region
    D. The θ and $\emptyset$ components of H are of the same order of magnitude in the near field region

Answer B

94. The concept of magnetic vector potential finds its major application in deriving expression of magnetic field intensity especially for _____
    A. Real fields
    B. Imaginary fields
    C. Complex fields
    D. Intensity fields

Answer C

95. Which of the following is false about the single antenna for long distance communication?
    A. No side lobes
    B. Enlarging may create side lobes
    C. High directivity is required
    D. High Gain is required

Answer A

96. The directivity of an antenna array can be increased by adding more antenna elements, as a larger number of elements
    A. Improves the radiation efficiency
    B. Allow more power to be transmitted by the antenna
    C. Results in a better impedance matching
    D. Increases the effective area of the antenna

Answer D

97. The line-of sight communication requirest ransmit and receive antennas to face each other. If the transmit antenna is vertically polarized for best reception the receiver antenna should be
    A. Horizontally polarized
    B. Vertically polarized
    C. At 45^0 with respect to horizontal polarization
    D. At 45^0 with respect to vertical polarization

Answer B

98. Which of the following is **False** regarding a reflector antenna?
    A. Reflector antennas are high gain antenna with two antennas
    B. Both the primary and secondary antennas are excited
    C. The pattern of the reflector in the reflector antenna is the secondary pattern
    D. A dual reflector contains two reflectors and are primary feed

Answer B

99. Which of the following is the disadvantage of Microstrip line feeding?
    A. Spurious feed radiation decreases with increase in substrate thickness
    B. There is no Bandwidth limit
    C. Spurious feed radiation increases with increase in substrate thickness
    D. Low spurious radiation

Answer C

100. Which of the following efficiency is used to measure the power-loss at the feed pattern which is intercepted by reflector?
    A. Illumination
    B. Spill over
    C. Aperture
    D. Taper

Answer B