UNIT-1

1. The voltage at which forward current through the diode starts increasing rapidly is called as

a) Cut in voltage b) Breakdown voltage c) Saturation voltage d) Cut off voltage

2. Smaller the ripple factor, the output will have higher components of

a) DC b) AC c) spike d) pulse

3. The efficiency of full wave rectifier is about

a) 81.2 b) 0.46 c) 1.21 d) 40.6

4. In a bipolar junction transistor the collector current is controlled by

a) Base current b) Collector voltage c) Collector resistance d) None

5. If a 2 mV input signal produces a 2V output signal, what is the voltage gain?

a) 1000 b) 0.004 c) 100 d) 0.001

6. Total emitter current in BJT is

a) $I_B + I_C$ b) $I_C + I_{CBO}$ c) $I_C + I_E$ d) $I_B - I_C$

7. Which is not a MOSFET terminal?

a) Base b) Drain c) Source d) Gate

8. JFET is considered as a voltage controlled device because _____.

a) Drain current is controlled by gate voltage

b) Gate current is controlled by drain voltage

c) Gate current is controlled by source voltage

d) Drain current is controlled by source voltage

9. Which of the following electrical characteristics is not exhibited by an ideal op-amp?

a) **Infinite output resistance** b) Infinite bandwidth

c) Infinite voltage gain d) Infinite slew rate

10. When the p-n junction diode is forward biased, it offers

a) low resistance b) high resistance c) low voltage d) high voltage

11. Zener diode is mainly used as

a) Voltage regulator b) Comparator c) Oscillator d) Amplifier

12. The efficiency of full wave rectifier is about

a) 81.2% b) 46 % c) 1.21% d) 40.6 %

4. What is the collector current for a C-E configuration with a beta of 100 and a base current of 30 μA?

a) 3 mA b) 3μA c) 30 μA d) 30 mA

13. In a CE amplifier circuit, the output signal generates a phase shift of

a) 180^0 b) 90^0 c) 0^0 d) 270^0

14. For a BJT, the following statement is true

a) $I_E = I_C$ b) $I_B = I_C$ c) $I_B = I_E$ d) $I_B = \alpha I_E$

15. Which transistor element is used in CMOS logic?

a) MOSFET b) **J**FET c) Bipolar d) Unijunction

16. Calculate I_D in n- JFET, Given V_{GS}= -2V, V_P= -4V and I_{DSS} =4mA

a) 1mA b) 2mA c) 3mA d) 4mA

17. When the p-n junction diode is reverse biased, it offers

a) high resistance b) low resistance c) low voltage d) high voltage

18. Higher the ripple factor, the output will have higher components of

a) AC b) DC c) spike d) pulse

19. The r.m.s value of load current in a full wave rectifier is

a) 0.707 I_m b) 0.5π c) 0.5 I_m d) 0.3183 I_m

20. The signal voltage gain of an amplifier, A_V, is defined as _____.

a) $\mathbf{A_V = \frac{V_{out}}{V_{in}}}$ b) $A_V = I_C * R_C$ c) $A_V = \frac{V_{in}}{V_{out}}$ d) $A_V = \frac{V_{BE}}{V_{CC}}$

21. Base terminal of the transistor in Common Base configuration is connected to

a) Input and output b) Output only c) Input only d) Kept open

22. A transistor has a beta of 200 and a base current of 40 μA in CE configuration. Then the collector current is

a) 8 mA b) 8μA c) 80 μA d) 80 mA

23. When n-channel JFET with gate terminal open circuited and a positive voltage V_{DS} is applied across drain and source terminals, depletion region is wider near

a) Drain b) Source c) Gate d) None

24. In n- JFET the drain current is 2mA, when V_{GS} = -8V and V_P = -8V, the values of I_{DSS} is

a) 2mA b) 1mA c) 3mA d) 4mA

25. The amount of ripples present at the output of half wave rectifier is

a) 1.21 b) 0.81 c) 0.46 d) 0.50

26. Higher the ripple factor, the output will have smaller components of

a) DC b) AC c) spike d) pulse

27. When forward biased, a p-n junction diode

a) Conducts current b) Blocks current c) has high resistance d) low voltage

28. A transistor has a beta of 200 and a base current of 40 μA in CE configuration. Then the emitter current is

a) 8.04 mA b) 80μA c) 80.04 μA d) 80 mA

29. Amplifiers and oscillators using BJT are operated in ..... region

a) Active b) Cut off c) Saturation d) Inverted mode

30. A transistor has I_B = 0.08 mA and I_E = 9.60 mA. The value of β is

a) 119 b) 129 c) 960 d) 100

31. A JFET is a.....controlled device whereas a bipolar transistor is a.....controlled device.

a) Voltage, current b) Drain, gate c) Gate, drain d) Current, voltage

32. The enhancement type MOSFET works only with _____.

a) large positive gate voltage b) large negative gate voltage

c) large positive source voltage d) large negative drain voltage

33. The amount of ripples present at the output of a full wave rectifier is

a) 48% b) 81% c) 42% d) 52%

34. The r.m.s value of load current in a half wave rectifier is

a) 0.5 I_m b) 0.5π c) 0.707 I_m d) 0.3183 I_m

35. Zener diode regulates output voltage only when it is connected in

a) Reverse bias b) Forward bias c) Short d) Open

36. A transistor has I_B = 0.06 mA and I_E = 9.00 mA. The value of β is

a) 149 b) 129 c) 960 d) 100

37. In CE configuration output VI characteristics is plotted by taking

a) V_{CE} verses I_C for constant I_B b) V_{CE} verses I_C for constant I_E

c) V_{CE} verses I_C for constant V_{CB} d) V_{CE} verse I_E for constant I_C

38. A highly stable biasing network used in CE-RC coupled amplifier is

a) Voltage divider biasing circuit b) Collector feedback bias circuit

c) Base bias circuit d) Emitter bias circuit

39. In JFET, the drain voltage above which there is no increase in the drain current is called..... voltage

a) Pinch off voltage b) Critical voltage c) Breakdown voltage d) Pick off voltage

40. The MOSFET stands for

a) Metal oxide semiconductor FET b) Metal oxide surface FET

c) Metal oxidized selenium FET d) Metal of surface FET

41. A silicon diode is connected in series to a dc supply of 2 volts and resistance of 13 **Ω**, the current in the circuit is

a) 0.10A b) 0.55 A c) 0.45 A d) 1.5A

42. The DC load current of a half wave rectifier is

a) Im/π b) 2Im/π c) 2Idc/π d) 1.414/π

43. A sinusoidal voltage of peak value 40V is applied to a half wave rectifier with R_L = 800 **Ω** and R_f = 8 **Ω**. The peak value of the current is

a) 49.5 mA b) 4.95 mA c) 0.495 mA d) 4.95 A

44. A transistor has I_B = 0.06 mA and I_E = 9.00 mA. The value of α is

a) 0.99 b) 9.9 c) 990 d) 100

45. When the transistor operates as an amplifier, the operating point is located

a) In the center of active region b) In the cut-off region

c) In the Saturation region d) In the Ohmic region

46. When BJT operates as a switch, it is operated alternately in _____

a) Cut-off and Saturation region b) Active and cut-off region

c) Saturation and active region d) Active and saturation region

47. JFET acts as constant current source above

a) Pinch off voltage b) Breakdown voltage c) Threshold voltage d) None

48. MOSFET has greatest application in digital circuit due to

a) Low power consumption b) Less noise

c) Small amount of space it takes on a chip d) None

49. A silicon diode is connected in series to a dc supply of 5 Volts and resistance of 1.5 kΩ, the current in the circuit is

a) 2.86 mA b) 3.86 mA c) 0.38 mA d) 1.5mA

50. Average DC load voltage of a full wave Bridge rectifier is

a) 2Vm/π b) 2Im/π c) Im/0.707 d) Im/0.5

51. What is the state of an ideal diode in the region of non-conduction?

a) Open circuit b) Short circuit c) Unpredictable d) Undefined

52. A transistor has I_B = 0.08 mA and I_E = 9.60 mA. The value of α is

a) 0.99 b) 9.9 c) 990 d) 100

53. The collector to base current gain β in terms of α is defined as

a) $\frac{\alpha}{1-\alpha}$

b) $\frac{\alpha}{1+\alpha}$

c) $\frac{\beta}{1+\alpha}$

d) $\frac{\beta}{1+\beta}$

54. The collector to emitter current gain α in terms of β is defined as

a) $\frac{\beta}{1+\beta}$

b) $\frac{\alpha}{1-\alpha}$

c) $\frac{\beta}{1+\alpha}$

d) $\frac{\alpha}{1+\alpha}$

55. In the ohmic region, the JFET can be used as

a) Voltage variable resistor b) Voltage variable inductor c) Voltage variable capacitor

d) Voltage variable current

56. The charge carriers in an N-channel JFET are

a) Electrons b) Neutrons c) Protons d) Holes

57. A germanium diode is connected in series to a dc supply of 4volts and resistance of 2 k**Ω**, the current in the circuit is

a) 1.85 mA b) 1.45mA c) 0.185 mA d) 18.5 mA

58. What is the resistance of an ideal diode in the region of conduction?

a) 0 Ω b) 5 k**Ω** c) Unpredictable d) Infinity

59. A zener diode of 10V is connected to a supply of 20V through a series resistance of 200

ohms. With no load, current through the zener is

a) 50 mA b) 500 mA c) 5 A d) 400 mA

60. The leakage current in a transistor is due to:

a) **Minority charge carriers** b) Majority charge carriers

c) Zener effect d) Breakdown

61. A bipolar junction transistor is a

a) Current controlled device b) Voltage controlled device

c) Resistance controlled device d) Junction controlled device

62. The range of collector to emitter current gain α is

a) 0.96 to 0.99 b) 20 to 200 c) 0.76 to 0.96 d) 0.50 to 1

63. n-channel FETs are superior to p-channel FETs because

a) Mobility of electrons is greater than that of holes b) They have high switching time

c) They consume less power d) Mobility of electrons is smaller than that of holes

64. When a JFET is cut off, it is like a ..... switch and when it is saturated, it is like a ..... switch

a) Open, closed b) Closed, closed c) Open, open d) Closed, open

65. A germanium diode is connected in series to a dc supply of 7.5 volts and resistance of 1.3 kΩ, the current in the circuit is

a) 5.53 mA b) 5.53 A c) 5.35 mA d) 1.53 mA

66. A Zener diode is a heavily doped semiconductor device that is designed to operate in

a) Reverse direction b) Forward direction c) Both forward and reverse d) None

67. The 7805 voltage regulator IC produces output voltage of

a) 5 V b) – 5 V c) ± 5 V d) 78 V

68. The range of collector to base current gain β is

a) 20 to 200 b) 20 to 100 c) 50 to 100 d) 10 to 50

69. The value of β for a silicon transistor given the collector current as 1 mA and base current as 25 μA is

a) 40 b) 4 c) 400 d) 4000

70. The value of α for a silicon transistor, given the collector current as 1 mA and base current as 25 µA is

a) 0.9756 b) 0.9276 c) 0.9376 d) 0.9176

71. For a JFET, above the pinch-off voltage, the drain current

a) Remains constant b) Decreases

c) Increases d) Varies parabolically

72. For a JFET, when gate to source voltage is made sufficiently negative, the drain current reaches zero mA when

a) $V_{GS} = -V_P$ b) $V_{GS} = V_P$ c) $V_{GS} = I_{DSS}$ d) $V_{GS} = I_D$

73. A silicon and a germanium diodes are connected in series to a dc supply of 8 volts and resistance of 2.5 kΩ, the current in the circuit is

a) 2.8 mA b) 28 mA c) 0.28 mA d) 2.8 A

74. In the breakdown region, zener diode behaves like a source of

a) Constant voltage b) Constant current c) Constant resistance d) Constant power

75. A resistance is connected in series with zener diode in a voltage regulator to

a) Protect the zener b) Properly reverse bias the zener

c) Properly forward bias the zener d) switch off the zener

76. The value of β for a silicon transistor given the collector current as 1 mA and base current as 10 µA is

a) 100 b) 10 c) 0.1 d) 1000

77. The value of α for a silicon transistor, given the collector current as 1 mA and base current as 10 µA is

a) 0.9900 b) 0.9276 c) 0.9376 d) 0.9176

78. In CE-RC coupled amplifier, an emitter bypass capacitor is connected in parallel with emitter resistance R_E to

a) To provide a low reactance path to the amplified ac signal

b) Increase the noise in the circuit

c) To support the resistance R_E

d) To block the dc voltage

79. For a JFET, as V_{GS} is made more and more negative, saturation level of I_D reduces further and the pinch-off voltage continues to drop in

a) Parabolic form b) Linear form c) Exponential form d) None

80. Whenever a JFET operates above pinch-off voltage

a) Drain current remains nearly constant b) Drain current increases steeply

c) Depletion regions become smaller d) Drain current starts decreasing

UNIT-II

1. Which of the following electrical characteristics is not exhibited by an ideal op-amp?

a) **Infinite output resistance** b) Infinite bandwidth

c) Infinite voltage gain d) Infinite slew rate

2. An integrator circuit using an Op Amp has …….in its feedback path

a) Capacitor b) Resistor c) inductor d) Diode

3. The identification 555 for IC 555 timer is mainly because

a) It has a series of three $5k\ \Omega$ resistors in the internal circuitry

b) It has voltage levels of 5V in the internal circuitry

c) It has five Op Amp comparators internally

d) None of these

4. IC 555 timer working as a free running oscillator is a

a) DC to AC converter b) AC to DC converter

d) DC to DC converter d) DC to DC inverter

5. In Colpitts' oscillator, the components used in the feedback network are

a) 2C and 1L b) 2L and 1C c) 2R and 2C d) 2L and 2C

6. With a resistance value of R=1k**Ω** in a feedback network of RC oscillator frequency of oscillations generated is 5 kHz. The value of the capacitor C is

a) 0.0129 μF b) 0.129 μF c) 0.0219 μF d) 129 μF

7. Gain with negative feedback is given by $A_f = \frac{A}{1+A\beta}$. The closed loop gain is

a) A_f b) A c) β d) None

8. An amplifier has an open loop voltage gain of 1000. If 10% negative voltage series feedback is used, then the closed loop gain is

a) 9.9 b) 99.9 c) 0.9 d) 990

9. Find the output voltage of an ideal op-amp if V_1 and V_2 are the two input voltages

a) $V_0 = A(V_1 - V_2)$ b) $V_0 = V_1 - V_2$ c) $V_0 = A(V_1 + V_2)$ d) $V_0 = V_1 \times V_2$

10. A differentiator circuit using an Op Amp has …….in its feedback path

a) Resistor b) Capacitor c) Inductor d) Diode

11. The voltage levels fixed at one of the terminals of two comparators in the internal circuitry of IC 555 timer are

a) $\frac{1}{3}V_{cc} \& \frac{2}{3}V_{cc}$

b) $V_{cc} \& \frac{2}{5}V_{cc}$

c) $\frac{1}{5}V_{cc} \& \frac{2}{5}V_{cc}$

d) $0V \ \& \frac{2}{5}V_{cc}$

12. A sine wave of 0.5 V peak voltage is applied as an input to an inverting amplifier with R_1 = 10 kΩ and R_f = 50 kΩ The output voltage Vo is

a) **-2.5 V peak** b) 5.2 V peak c) -10 V peak d) -2.5 V peak-peak

13. In Hartley oscillator, the components used in the feedback network are

a) 2L and 1C b) 2L and 2C c) 2R and 2C d) 1L and 2C

14. For an amplifier with negative feedback, the closed loop gain is given by

a) $\boldsymbol{A_f = \frac{A}{1+A\beta}}$

b) $A_f = \frac{A}{1-A\beta}$

c) $A_f = \frac{A}{1-\beta}$

d) $A_f = \frac{A}{1-V\beta}$

15. In a practical oscillator circuit, to start oscillations, the loop gain Aβ must be

a) Greater than 1 b) Equal to 1 c) Less than 1 d) Not equal to 1

16. An amplifier has an open loop voltage gain of 2000. If 40% negative voltage series feedback is used, then the closed loop gain is

a) 2.49 b) 24.9 c) 0.249 d) 249

17. The output voltage obtained for an ideal op-amp is by

a) Amplifying the difference between the two input voltages

b) Amplifying individual input voltages

c) Amplifying products of two input voltage

d) None of the mentioned

18. The output voltage V_0 of an Op Amp integrator is given by

a) $\boldsymbol{V_0 = -\frac{1}{R_1 C_f}\int_0^t V_{in} dt}$ b) $V_0 = -\frac{1}{C_f}\int_0^t V_{in} dt$

c) $V_0 = -\frac{1}{R_1 C_f}\int_{-\infty}^{t} V_{in} dt$ d) $V_0 = -\frac{1}{R_f C_1}\int_{0}^{t} V_{in} dt$

19. The outputs of two comparators are connected to a …… in the internal circuitry of IC 555 timer

a) S-R Flip Flop b) D-type Flip Flop **c)** J-K Flip Flop d) T-Type Flip Flop

20. A sine wave of 0.5 V peak voltage is applied as an input to a non- inverting amplifier with R_1 = 10 kΩ and R_f = 50 kΩ The output voltage Vo is

a) 3 V peak b) 2.5 V peak c) -3 V peak d) 3 V peak-peak

21. In an amplifier, positive feedback leads to

a) Oscillations b) Amplification c) Breakdown d) None of these

22. For an amplifier with positive feedback, the closed loop gain is given by

a) $\boldsymbol{A_f = \frac{A}{1-A\beta}}$

b) $A_f = \frac{A}{1+A\beta}$

c) $A_f = \frac{A}{1-\beta}$

d) $A_f = \frac{A}{1-V\beta}$

23. The sustained oscillations in an oscillator circuit is obtained by setting the loop gain $A\beta$ as

a) Greater than 1 b) Equal to 1 c) Less than 1 d) Not equal to 1

24. An amplifier has an open loop voltage gain of 100,000. If the negative voltage series feedback factor is 0.01, then the closed loop gain is

a) 99.9 b) 9.9 c) 0.9 d) 990

25. Which is not the ideal characteristic of an op-amp?

a) Input Resistance is zero

b) Output impedance is zero

c) Bandwidth is infinity

d) Open loop voltage gain is infinity

26. The output voltage V_0 of an Op Amp differentiator is given by

a) $\boldsymbol{V_0 = -R_f C \frac{dV_{in}}{dt}}$ b) $V_0 = -\frac{1}{C_f}\int_0^t V_{in} dt$

c) $V_0 = -\frac{1}{R_f C}\frac{dV_{in}}{dt}$ d) $V_0 = -\frac{1}{R_f}\int_0^t V_{in} dt$

27. The charging time or ON time of the capacitor in Astable mode of operation using IC 555 timer is

a) $\boldsymbol{T_{ON} = 0.693(R_1 + R_2)C}$ b) $T_{ON} = 0.693(R_2)C$

c) $T_{ON} = 0.693(R_1)C$ d)$T_{ON} = 0.693(F)C$

28. A sine wave of 0.5 V peak voltage is applied as an input to a non- inverting amplifier with R_1 = 12 kΩ and R_f = 24 kΩ The output voltage Vo is

a) 1.5 V peak b) -2.5 V peak c) 10 V peak d) -5 V peak

29. In an amplifier with positive feedback, open loop gain A is 20 with feedback factor β as 0.04. Then the gain of the amplifier with feedback is

a) 100 b) 50 c) 200 d) Infinity

30. The feedback factor of Colpitt's oscillator is given by

a) $\boldsymbol{\beta = \frac{C_2}{C_1}}$

b) $\beta = \frac{C_1}{C_2}$

c) $\beta = \frac{A}{A_f}$

d) $\beta = \frac{A_f}{A}$

31. Which of the following is not the advantages of negative feedback amplifier?

a) Unstable gain b) Higher input impedance c) Reduction in noise d) Lower output impedance

32. An amplifier has an open loop voltage gain of 10,000. If the negative voltage series feedback factor is 0.01, then the closed loop gain is

a) 99 b) 9.9 c) 0.9 d) 990

33. Which factor determines the output voltage of an op-amp?

a) Both positive and negative saturation voltage b) Negative saturation

c) Positive saturation d) Supply voltage

34. The output voltage swing of a comparator for an applied input voltage depends on

a) Dual power supply voltages b) Regulated power supply voltages

c) AC signals applied at the terminals of the Op Amp d) DC signals applied at the terminals of the Op Amp

35. The two Op Amps used in the internal circuit of IC 555 time function as

a) Comparators b) voltage followers c) Differentiators d) Amplifiers

36. A sine wave of 0.5 V peak voltage is applied as an input to an inverting amplifier with R_1 = 12 kΩ and R_f = 24 kΩ The output voltage Vo is

a) -1.0 V peak b) -2.5 V peak c) -1 V peak-peak d) -5 V peak

37. In an amplifier with negative feedback, open loop gain A is 20 with feedback factor β as 0.04. Then the gain of the amplifier with feedback is

a) 11.11 b) 100 c) 200 d) Infinity

38. The feedback factor of Hartley oscillator is given by

a) $\boldsymbol{\beta = \frac{L_1}{L_2}}$

b) $\beta = \frac{L_2}{L_1}$

c) $\beta = \frac{A}{A_f}$

d) $\beta = \frac{A_f}{A}$

39. Which among the following parameters acts as an initiator for the operation of an oscillator in the absence of input signal?

a) Noise voltage b) Noise power c) Noise current d) Noise temperature

40. In which type of oscillator circuit capacitor split representation can be seen in tank circuit?

a) Colpitts b) RC phase shift c) Hartley d) Weinbridge

41. A non-inverting closed loop op amp circuit generally has a gain factor

a) Greater than one b) Less than one c) Zero d) Equal to one

42. An inverting amplifier using Op Amp with R_1 and R_f as the resistors provide an output voltage equal to one of them as

a) $\boldsymbol{V_0 = -\left(\frac{R_f}{R_1}\right) V_{in}}$

b) $V_0 = -\left(1 + \frac{R_f}{R_1}\right) V_{in}$

c)$V_0 = \left(1 + \frac{R_f}{R_1}\right) V_{in}$

d) $V_0 = \left(\frac{R_f}{R_1}\right) V_{in}$

43. The duty cycle 'D' of IC 555 timer in astable mode in terms of its time period is defined by

a) $\boldsymbol{\frac{T_{ON}}{T_{ON}+T_{OFF}}}$ b) $\frac{T_{ON}}{T_{OFF}}$ c) $\frac{T}{T_{OFF}}$ d) None

44. A sine wave of 0.5 V peak voltage is applied as an input to a non- inverting amplifier with R_1 = 6 kΩ and R_f = 24 kΩ The output voltage Vo is

a) 2.5 V peak b) -2.5 V peak c) 10 V peak d) 2.5 V peak-peak

45. In an RC phase shift oscillator, the resistances in the feedback network are 4.7 kΩ and capacitor values are C = 0.47μF. The frequency of oscillations is

a) 29.413 Hz b) 294.13 Hz c) 2941.3 Hz d) None of these

46. Negative feedback amplifier

a) Reduces gain b) Increases gain c) Reduces noise d) Reduces phase shift

47. The tank circuit of a Colpitt's oscillator has L= 5 mH with $C_1 = 22.22\ nF\ and\ C_2 = 2.222\ nF$. The feedback factor β is

a) 0.1 b) 0.001 c) 0.01 d) 1

48. In which type of oscillator circuit inductor split representation can be seen in tank circuit?

a) Hartley b) RC phase shift c) Colpitts d) Wein bridge

49. An ideal OP-AMP has following characteristics

a) R_i = infinity, A = infinity, R_o = infinity

b) Ri = 0, A=infinity Ro = zero

c) Ri = infinity, A = 0, Ro = infinity

d) Ri = 0, A = infinity, Ro = infinity

50. A non-inverting amplifier using Op Amp with $R_1\ and\ R_f$ as the resistors provide an output voltage equal to one of them as

a) $\boldsymbol{V_0 = \left(1 + \frac{R_f}{R_1}\right) V_{in}}$

b) $V_0 = -\left(\frac{R_f}{R_1}\right) V_{in}$

c) $V_0 = -\left(1 + \frac{R_f}{R_1}\right) V_{in}$

d) $V_0 = \left(\frac{R_f}{R_1}\right) V_{in}$

51. The duty cycle 'D' of IC 555 timer in astable mode in terms of resistors used in the external circuit is defined by

a) $\boldsymbol{\frac{R_1+R_2}{R_1+2R_2}}$

b) $\frac{R_1+2R_2}{R_1+R_2}$

c) $\frac{R_1-R_2}{R_1-2R_2}$

d) $\frac{R_1+R_2}{R_1-2R_2}$

52. A non-inverting Op-Amp has a gain of 61 with R1 = 1 kΩ. The resistor in the feedback path must have a value of

a) 60 kΩ b) 59 kΩ c) 61 kΩ d) 62 kΩ

53. An RC network in an RC phase shift oscillator has C = 0.1 μF. The frequency of oscillations is 1 kHz. The value of R used in the feedback network is

a) 650 Ω b) 500 Ω c) 600 Ω d) 1 kΩ

54. RC phase shift oscillator is a

a) Low frequency oscillator b) High frequency oscillator
c) Stable frequency oscillator d) Relaxation oscillator

55. In a Hartley oscillator, if L1 = 5 mH, L2 = 10 mH and C = 0.01μF, the value of the feedback factor β is

a) 0.5 b) 0.05 c) 50 d) 500

56. The frequency of oscillations generated by RC phase shift oscillator is

a) $\frac{1}{2\pi\sqrt{6}RC}$ b) $\frac{1}{2\pi RC}$ c) $\frac{1}{2\pi\sqrt{6RC}}$ d) $\frac{1}{2\pi 6RC}$

57. For an Op-Amp having differential gain A_d and Common mode gain Ac, CMRR is

a) A_d/Ac b) A_d + Ac c) 1+ (A_d/Ac) d) Ac/A_d

58 A voltage follower using Op Amp is also known as

a) Buffer amplifier b) Non inverting amplifier c) Inverting amplifier d) Switch

59. The pin number 7 in IC 555 timer is assigned as

a) Discharge pin b) Threshold pin c) output pin d) None of these

60. A non-inverting Op-Amp has a gain of 61 with R1 = 2 kΩ. The resistor in the feedback path must have a value of

a) 120 kΩ b) 121 kΩ c) 61 kΩ d) 62 kΩ

61. An RC network in an RC phase shift oscillator has C = 0.2 μF. The frequency of oscillations is 1 kHz. The value of R used in the feedback network is

a) 325 Ω b) 500 Ω c) 600 Ω d) 1 kΩ

62. Hartley oscillator is a

a) High frequency oscillator b) Stable frequency oscillator
c) Low frequency oscillator d) Relaxation oscillator

63. In a Hartley oscillator, if L1 = 7 mH, L2 = 10 mH and C = 0.01μF, the value of the feedback factor β is

a) 0.7 b) 0.07 c) 70 d) 700

64. The frequency of oscillations generated by Colpitts oscillator is

a) $\frac{1}{2\pi\sqrt{LC_{eq}}}$ b) $\frac{1}{2\pi\sqrt{L_{eq}C}}$ c) $\frac{1}{2\pi\sqrt{LC}}$ d) $\frac{1}{2\pi LC}$

65. A simple application of an Op-Amp that can be used to generate a gain of unity is

a) Voltage follower b) Differentiator c) Integrator d) Comparartor

66. Op Amp Comparator is a circuit whose output voltage switches between

a) $+V_{sat}, -V_{sat}$ b) $+V_{in}, -V_{in}$ c) $+V_o, -V_o$ d) None

67. The discharge pin in IC 555 timer is connected to ---------- of the transistor.

a) Collector terminal b) Emitter terminal c) Base terminal d) None of these

68. An inverting Op-Amp has a gain of - 61 with R1 = 1 kΩ. The resistor in the feedback path must have a value of

a) 61 kΩ b) 59 kΩ c) 60 kΩ d) 62 kΩ

69. The components in the feedback network of LC oscillators are

a) L & C components b) R & C components c) Only L Component d) None of these

70. What is an angle of phase shift for each designed RC network in the Phase Shift Oscillator circuit?

a) 60^0 b) 45^0 c) 30^0 d) 90^0

71. In a Hartley oscillator, if L1 = 2 mH, L2 = 8 mH and C = 0.01µF, the value of the feedback factor β is

a) 0.25 b) 0.025 c) 250 d) 25

72. The frequency of oscillations generated by Hartley oscillator is

a) $\frac{1}{2\pi\sqrt{L_{eq}C}}$ b) $\frac{1}{2\pi\sqrt{LC_{eq}}}$ c) $\frac{1}{2\pi\sqrt{LC}}$ d) $\frac{1}{2\pi LC}$

73. For an ideal op-amp, which of the following is false?

a) The current from output terminal is zero

b) The current into the input terminals is zero

c) The differential voltage between the input terminals is zero

d) The output resistance is zero

74. With reference to the output voltage of an inverting Op Amp summer $V_0 = -\left(\frac{R_f}{R_1}V_1 + \frac{R_f}{R_2}V_2 + \frac{R_f}{R_3}V_3\right)$, if $R_f = R_1 = R_2 = R_3 = R$, then

a) $\boldsymbol{V_0 = -(V_1 + V_2 + V_3)}$

b) $V_0 = -V_1 + V_2 + V_3$

c) $V_0 = V_1 + V_2 + V_3$

d) None of these

75. The duty cycle D in astable mode using IC 555 is obtained using

a) External resistors b) Internally connected resistors

c) Comparators d) RS Flip flop

76. An inverting Op-Amp has a gain of - 61 with R1 = 1 kΩ. The resistor in the feedback path must have a value of

a) 162kΩ b) 82 kΩ c) 182 kΩ d) 62 kΩ

77. In an RC-Phase shift oscillator, the components used in the feedback network are

a) 3R and 3C b) 1R and 1C c) 4R and 4C d) 2R and 2L

78. Gain with negative feedback is given by $A_f = \frac{A}{1-A\beta}$. The feedback factor is

a) $\boldsymbol{\beta}$ b) A **c)** A_f d) None

79. In a Colpitts oscillator, if C1 = 100 pF, C2 = 60 pF and L = 0.422 H, the value of the feedback factor β is

a) 0.6 b) 0.06 c) 60 d) 600

80. The criterion that determines mathematical condition to generate sustained oscillations is

a) Barkhausen b) Shockley c) Pinch off d) Threshold

UNIT-III

1. Which of the following statements are true for von Neumann architecture?

a) Shared bus between the program memory and data memory

b) Separate bus between the program memory and data memory

c) External bus for program memory and data memory

d) External bus for data memory only

2. Harvard architecture has _____

a) all of the mentioned

b) Dedicated buses for data and program memory

c) Pipeline technique

d) Complex architecture

3. The unit used for measuring Message or information is

(a) bits per second (b) Hertz (c) Ohms (d) meter per second

4. The initial mobile communication systems for public safety in United states used the following modulation technique,

a) Amplitude modulation
b) Frequency modulation
c) Phase modulation
d) Time based modulation

5. Actuators are used to

a) Make a mechanical movement

b) Sense an object

c) Activate a chemical

d) All of the above

6. The function of a sensor is to _____

a) Detect events within specified environment

b) Separate physical parameters

c) Only Track the data

d) None

7. Fibre optic cable is a ---------- type of channel.

(a) Wired channel (b) Free space channel (c) Radio channel (d) Wireless channel

8. The mechanism of using the same frequency band within a geographical area in a Cellular or mobile communication system is referred to as,

a) Frequency reuse

b) Efficiency

c) Reliability

d) Bandwidth coordination

9. A microcontroller at-least should consist of:

a) CPU, RAM, ROM, I/O ports and timers

b) RAM, ROM, I/O ports and timers

c) CPU, RAM, I/O ports and timers

d) CPU, ROM, I/O ports and timers

10. Which of the following is true about microprocessors?

a) It contains ALU, CU, and registers

b) It has an internal memory

c) It has interfacing circuits

d) It uses Harvard architecture

11. ------- converts the information into signal suitable to be transmitted over the communication medium.

(b) Transmitter (b) Transmission line (c) Receiver (d) Channel

12. The inherent interference resistance property between wireless cellular channels is observed in ,

a) Code Division Multiple Access
b) Frequency Division Multiple Access
c) Time Division Multiple Access
d) Space Division Multiple Access

13. Which of the following is not an example of a Small-Scale Embedded Systems?

a) Cell Phone

b) Electronic Barbie doll

c) Simple Calculator

d) Electronic Toy Car

14. Which of the following processor architecture supports pipelining?

a) Harvard

b) Von Neumann

c) Both of these

d) None of these

15. In a communication system, the noise can be generated at the

(a) transmitter, channel, receiver (b) channel, receiver

(c) transmitter, channel (d) only in the channel

16. A fixed station in a mobile radio system used for radio communication with the mobile stations is

a) Base station b) Cellular station c) Switching center d) Public switching station

17. Which of the following is true about optocouplers?

a) Optocoupler can be used in both input and output circuitry

b) Optocoupler acts as an input device only

c) Optocoupler acts as an output device only

d) None of these

18. Which of the following is example for the input subsystem of an embedded system?

a) Optocoupler

b) LED

c) Seven Segment

d) None of these

19. Best example for natural noise is

(a) Rain (b) Traffic noise (c) Industrial noise (d) Sound pollution

20. The radio channel used for transmission of information from a base station to a mobile station is called,

a) Forward channel

b) Reverse channel

c) Control channel

d) Mobile channel

21. Which one of the following offers external chips for memory and peripheral interface circuits?

a) Microprocessor

b) Microcontroller

c) Embedded system

d) Peripheral System

22. Princeton architecture is also known as

a) Von Neumann architecture

b) Harvard

c) RISC

d) CISC

23. Best example for man-made noise is

(a) Traffic noise (b) Rain (c) Radiations from sun, stars (d) Reflections from earth

24. The process of transferring a mobile station from one base station to another base station is called

a) Hand-off
b) Channel efficiency
c) Frequency reuse
d) Frequency Division Duplexing

25. Processor which is complex and expensive to produce is _____

a) CISC

b) RISC

c) EPIC

d) Multi-core

26. A computer that uses the same memory space for both data and program instructions is classified as ___.

a) Von Neumann architecture

b) Memory architecture

c) Harvard architecture

d) None of the above

27. The speech signal frequency range is

(a) 300 Hz to 3.4 kHz (b) 20 Hz to 20 kHz (c) 30 to 34 kHz (d) 10 to 10 kHz

28. In a cellular radio system, the _____ connects the cellular base stations and mobile stations to the Public Switched Telephone Networks.

a) Mobile Switching Center (MSO)
b) Base station'(BS)
c) Forward Control Channel (FCC)
d) Time Division Multiple Access(TDMA)

29. ASIC stands for?

a) Application Specific Integrated Circuit

b) Avionics Subsystem Interface Contractor

c) Aviation Security Identification Card

d)Application-Specific introduction code

30. A ___ provides fast, discrete-time, signal-processing instructions

a) DSP b) DPS c) ASSP d) GPP

31. The audio frequency range is

(a) 20 Hz to 20 kHz (b) 30 to 34 kHz (c) 300 Hz to 3.4 kHz (d) 10 to 10 kHz

32. In a cellular system, the channel used for voice transmission from the base station to the mobile station is called _____ .

a) Forward Voice Channel (FVC)

b) Forward Control Channel(FCC)

c) Reverse Control Channel(RCC)

d) Reverse Voice Channel (RVC)

33. Which of the following is true about Embedded System?

a) All of them

b) An embedded system usually performs a specialized operation and does the same repeatedly

c) It must have a memory, as its software usually embeds in ROM

d) It must have connected peripherals to connect input and output devices.

34. Von-Neumann Architecture is Simple in design.

a) Yes

b) No

c) Can be yes or no

d) Cannot say

35. The loss in the transmission is minimum for the following type of wire

(a) Fiber optic cable (b) Coaxial cable () Flat cable (d) Copper wire

36. If there are 4 subgroups within a frequency band, for a cellular system consisting of a total of 7 cells, the total number of available radio channels is _____.

a) 28 b) 56 c) 11 d) 3

37. RISC stands for

a) Reduced Instruction Set Computer

b) Remaining Instruction Set of Computer

c) Remaining Intermediate Storage of Computer

d) Reduced Intermediate Storage of Computer

38. CISC stands for

a) Complex Instruction Set Computer

b) Computer Instruction Set Compliment

c) Complete Instruction Set Compliment

d) Computer Indexed Set Components

39. Which of the following channels used for communication has highest bandwidth?

(a) Fibre optic cable (b) Pair of wires (c) Co axial cable (d) Flat cable

40. The following frequency band is utilized in cellular or mobile communication system,

a) Radio frequency

b) Audio frequency

c) Audible frequency

d) Unlicensed frequency