

# Asst. Prof in Electronics commu.

APEC/21

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE ASKED TO DO SO.

## PRELIMINARY SCREENING

### TEST BOOKLET

Electronics & Communication Engineering

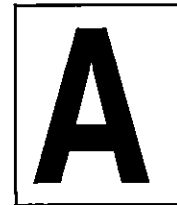
Time allowed :  $1\frac{1}{2}$  hours

Full marks : 100

Answer *all* the questions.

Questions are of equal value.

TEST BOOKLET SERIES



Serial No. .... **0157** .....

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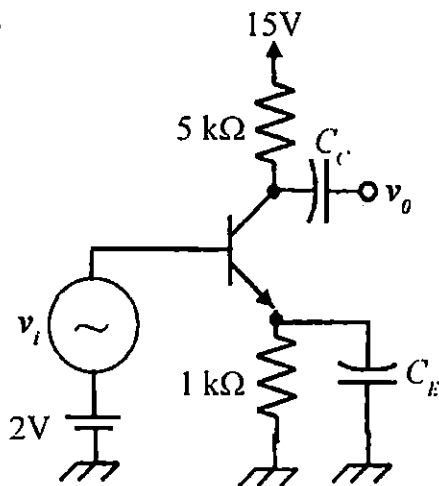
## INSTRUCTIONS

Candidates should read the following instructions carefully before answering the questions:

1. This booklet consists of 16 pages including this front page, containing 100 questions. **Verify the Page Nos. and Test Booklet series on each page and bring at once to the Invigilator's notice any discrepancy.**
2. Answers will have to be given in the OMR Sheet supplied for the purpose.
3. Before you proceed to mark in the OMR Sheet in response to various items in the Test Booklet, you have to fill in some particulars in the OMR Sheet. **Do not fold the OMR Sheet as this will result in error in your marks.**
4. All questions are of multiple-choice answer-type. You will find **four** probable answers (A), (B), (C) and (D) against each question. Find out which of the four answers appears to you to be correct or the best. Now darken the circle corresponding to the letter of the selected answer in the OMR Sheet with **Black Ball Point Pen**.
5. One and only one circle is to be fully blackened for answer. Any spot in any other circle (multiple circle) or in wrong circle will be considered as wrong answer. If more than one circle is encoded for a particular answer, it will be treated as a wrong answer. Use of whitener is strictly prohibited.
6. **There will be negative marking of  $\frac{1}{3}$  mark for each wrong answer.**
7. **There are blank pages at the end of this Booklet for Rough Work.**
8. **The OMR Sheet should be handed over to the Invigilator before leaving the Examination Hall. You are permitted to take away the used Test Booklet after completion of the examination.**

1. The guide wavelength of an electromagnetic wave propagating through a wave guide is
- less than its free-space wavelength.
  - equal to its free-space wavelength.
  - greater than its free-space wavelength.
  - any of the above depending on the mode of propagation.

2.



In the above amplifier circuit, the capacitors  $C_E$  and  $C_C$  have negligible reactance at the operating frequencies. The small signal gain ( $v_o/v_i$ ) of the amplifier is

- 5 V/V
  - 25 V/V
  - 250 V/V
  - 500 V/V
3. Assertion A : The system with transfer function  $10(s - 2)/(s^2 - 6s + 13)$  is unstable.
- Reason R : Systems with poles lying on the negative half of the  $s$ -plane are unstable.
- Both A and R are true and R is the correct reason for A.
  - Both A and R are true but R is not the correct reason for A.
  - A is true but R is false.
  - A is false but R is true.

4. Identify the part of the sentence that is grammatically incorrect:

She went to the gym despite of her illness.

- the
- gym
- of
- her

5. Choose the correct option:

Our teacher teaches History \_\_\_\_\_ English.

- across
- besides
- beside
- both

6. If an unbiased coin is tossed four times in succession, the probability of getting exactly two heads is

- 3/4
- 1/2
- 3/8
- 1/4

7. A  $50\Omega$  transmission line feeds an antenna having  $50\Omega$  input impedance. The VSWR on the line is

- 50
- 10
- 2
- 1

8. A Class-C amplifier is commonly used to amplify

- PCM signals
- Video signals
- Audio frequency signals
- Radio frequency signals

9. The drift current in a semiconductor sample depends on

- (A) applied electric field only.
- (B) the carrier concentration only.
- (C) both the applied electric field and the carrier concentration.
- (D) the carrier concentration and its gradient.

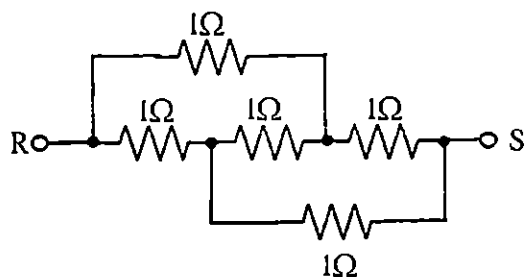
10. To transmit an 8-bit data with single-bit error-correcting Hamming code, the minimum required message length is

- (A) 10 bits
- (B) 12 bits
- (C) 15 bits
- (D) 17 bits

11. A capacitor of value  $C_1$  is charged to a voltage  $V_1$ . If another uncharged capacitor of value  $C_2$  is connected across the first in parallel, the voltage across the combination will be

- (A)  $(C_1 + C_2)V_1/C_2$
- (B)  $C_1V_1/(C_1 + C_2)$
- (C)  $(C_1 + C_2)V_1/C_1$
- (D)  $C_2V_1/(C_1 + C_2)$

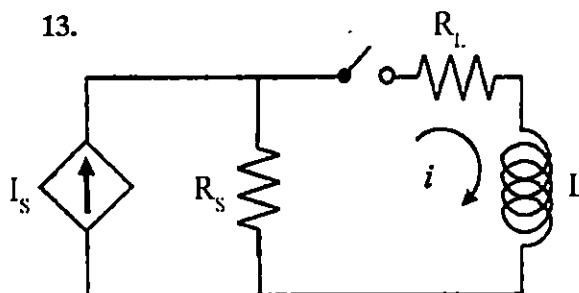
12.



The Resistance measured between points R and S in the above circuit is

- (A) 1  $\Omega$
- (B) 2  $\Omega$
- (C) 4  $\Omega$
- (D) 5  $\Omega$

13.



In the above circuit, the switch is closed at  $t = 0$ . The rate of change of current  $\frac{di}{dt} (0^+)$  is given by

- (A) 0
- (B)  $R_s I_s / L$
- (C)  $R_s R_L I_s / (R_s + R_L)$
- (D)  $(R_s + R_L) I_s / L$

14. The increase in drain current with drain voltage of a MOS transistor in its saturation region of operation is due to

- (A) Gate leakage
- (B) Velocity saturation
- (C) Channel length modulation
- (D) All of the above

15. Silica fibre used in fibre optic communication links has minimum dispersion at carrier wavelength of

- (A) 1,550 nm
- (B) 1,300 nm
- (C) 980 nm
- (D) 890 nm

16. Replace the underlined idiomatic expression proverb with correct alternative:

I stumbled upon some interesting old letters in my father's desk.

- (A) fell
- (B) jumped
- (C) surveyed
- (D) discovered by chance

Please Turn Over

17. The room temperature carrier concentration of an undoped elemental semiconductor is,  $n = p = 10^{10}/\text{cm}^3$  where 'n' and 'p' are respectively the electron and hole concentrations. When the semiconductor is doped to a concentration of  $10^{15}/\text{cm}^3$  with a group-V element, the carrier concentrations are

- (A)  $n = 10^{15}/\text{cm}^3$  and  $p = 10^{10}/\text{cm}^3$
- (B)  $n = 10^{15}/\text{cm}^3$  and  $p = 10^5/\text{cm}^3$
- (C)  $n = 10^5/\text{cm}^3$  and  $p = 10^{15}/\text{cm}^3$
- (D)  $n = 10^{10}/\text{cm}^3$  and  $p = 10^{15}/\text{cm}^3$

18. The Voltage Standing Wave Ratio in a rectangular waveguide can be measured using

- (A) Directional Coupler
- (B) E-Plane T
- (C) Hybrid-T
- (D) Slotted Waveguide

19. An arbitrary circuit containing sources and resistances can be equivalently represented by a single voltage source in series with a resistance using

- (A) Thevenin's theorem
- (B) Norton's theorem
- (C) Bisection theorem
- (D) Maximum power transfer theorem

20. Two systems  $S_1$  and  $S_2$  are defined by the following equations:

$$S_1: \rightarrow \frac{dy}{dt} + 3t.y(t) = t^2.x(t)$$

$$S_2: \rightarrow 3y(t) + 2 = x(x)$$

From the above we can conclude that

- (A) system  $S_1$  is linear but  $S_2$  is non-linear.
- (B) system  $S_1$  is non-linear but  $S_2$  is linear.
- (C) both systems are linear.
- (D) both systems are non-linear.

21. If a carrier signal  $[A_0 \cos(\omega_c t)]$  is modulated by a modulating signal  $m(t)$ , then the modulated signal represented by  $[m(t) \cdot \cos(\omega_c t)]$  contains

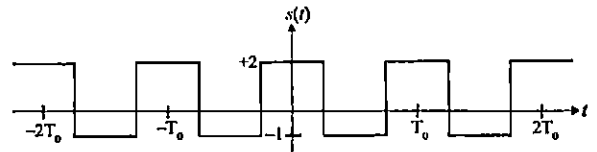
- (A) the carrier and one sideband only.
- (B) the carrier and both the sidebands.
- (C) one sideband only.
- (D) both the sidebands but no carrier.

22. Fill in the blank with correct option:

"Where's the \_\_\_\_\_ Post Office please?"

- (A) near
- (B) most near
- (C) more near
- (D) nearest

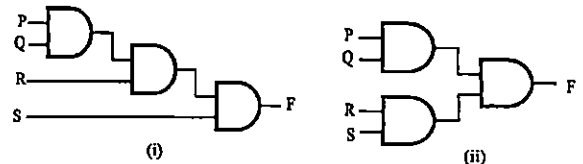
23.



Fourier analysis of the signal  $s(t)$  shown in the figure above will yield

- (A) sine terms only
- (B) cosine terms only
- (C) DC value and sine terms only
- (D) DC value and cosine terms only

24.



Both the circuits shown in Figures (i) and (ii) above implement the same logic function,  $F = (P.Q.R.S)$ . However, if each gate used in the circuits has a time delay ' $\tau$ ' then, under some conditions, glitch will be observed at the output of

- (A) both the circuits
- (B) only in the circuit of Fig. (i)
- (C) only in the circuit of Fig. (ii)
- (D) None of the circuits

25. Replace the underlined words with the correct option given below:

They thought that the young man would simply give up on the matter if he came to know that it would be a long legal case. Now they realise, they have caught a tartar!

- (A) an expert
- (B) dealing with a troublesome person
- (C) forced to leave
- (D) take risk

26. Where has India's First Moss Garden been inaugurated?

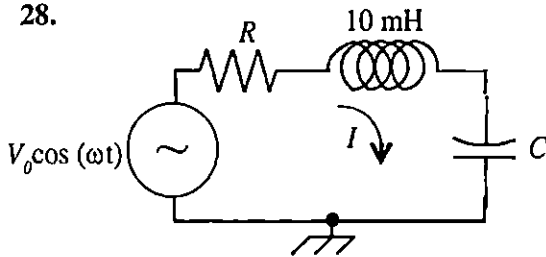
- (A) Kevadia, Gujarat
- (B) Nainital, Uttarakhand
- (C) Mandi, Himachal Pradesh
- (D) Subansiri, Arunachal Pradesh

27. Choose the synonym of the given word:

Parochial

- (A) Stagnant
- (B) Observer
- (C) Inability
- (D) Conservative

28.



As the signal frequency ' $\omega$ ' in the above circuit is changed keeping the signal amplitude  $V_0$  constant, the current ' $I$ ' through the circuit exhibits a peak at angular frequency  $\omega = 10^4$  rad/sec., with FWHM of 200 rad/sec. The value of the resistance ' $R$ ' is

- (A)  $1 \Omega$
- (B)  $2 \Omega$
- (C)  $5 \Omega$
- (D)  $10 \Omega$

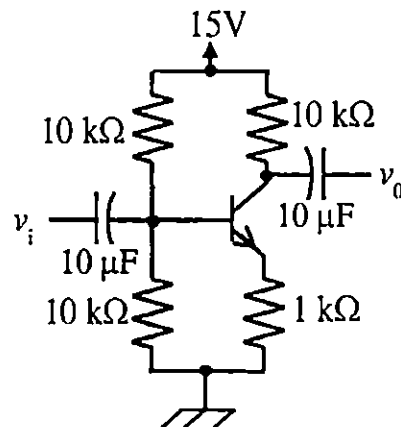
29. If the input impedance of a lossless short circuited transmission line of length ' $l$ ' is inductive, then

- (A)  $0 < l < \lambda/4$
- (B)  $l = \lambda/4$
- (C)  $\lambda/4 < l < \lambda/2$
- (D)  $l = \lambda/2$

30. In an 8085 microprocessor, which of the following instructions can be used in place of 'JMP' (unconditional jump) instruction?

- (A) PCHL
- (B) SPHL
- (C) XCHG
- (D) XTHL

31.

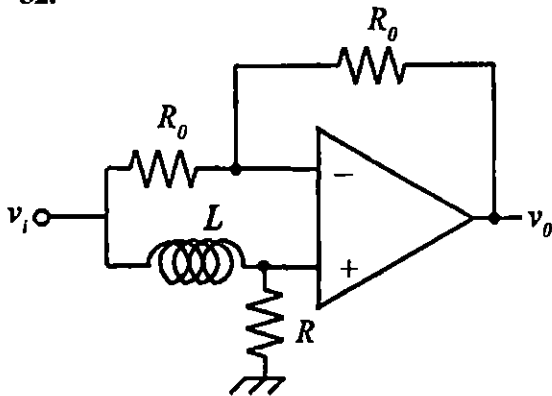


The transistor in the amplifier circuit above has  $h_{fe} = 100$ . The small signal mid-band voltage gain of the amplifier ( $v_o/v_i$ ) is

- (A) 10V/V
- (B) 100 V/V
- (C) 1,000 V/V
- (D) 10,000 V/V

Please Turn Over

32.



The transfer function  $[v_o(s)/v_i(s)]$  of the above circuit is

- (A)  $1/(1 + sL/R)$
- (B)  $1/(1 - sL/R)$
- (C)  $(1 + sL/R)/(1 - sL/R)$
- (D)  $(1 - sL/R)/(1 + sL/R)$

33. Choose the synonym of the given word:

Abstract

- (A) Notional
- (B) Valuable
- (C) Attractive
- (D) Jewel

34. Find out which part of the sentence has an error. If there is no mistake, the answer is 'No error'.

- (A) Now that he is living alone in his house
- (B) he cooks twice a week
- (C) cleans thrice a week.
- (D) No error

35. Where has been India's first solar-based Integrated Multi-Village Water Supply Project (IMVWSP) inaugurated?

- (A) Gujarat
- (B) Assam
- (C) Sikkim
- (D) Arunachal Pradesh

36. The solution of an electromagnetic wave equation in a medium with cylindrical conducting boundary is represented by

- (A) Bessel function
- (B) Error function
- (C) Gamma function
- (D) Laplace polynomials

37. Replace with correct tense forms of verbs given in bracket/s from the given options:

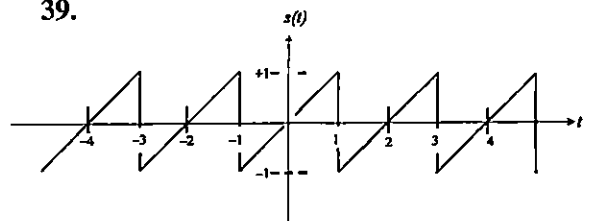
When Shyam reached the station, the train (leave).

- (A) left
- (B) had left
- (C) had had left
- (D) have left

38. Which is the first Indian documentary to win an Oscar award?

- (A) Stranger at the Gate
- (B) How do you Measure a Year?
- (C) The Elephant Whisperers
- (D) All that Breathes

39.



The power of the signal shown in the diagram above is

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

40. If a MOSFET having threshold voltage,  $V_T = 1.5V$  and  $k_n(W/L) = 0.25 \text{ mA/V}^2$  is biased to operate in the saturation region with a drain current  $I_D = 1 \text{ mA}$ , its transconductance will be nearly

- (A) 0.25 mA/V
- (B) 0.5 mA/V
- (C) 0.7 mA/V
- (D) 1.5 mA/V

41. The diagonal elements in the scattering matrix of a perfect three-port microwave circulator are

- (A) all 0
- (B) all 1
- (C) all imaginary
- (D) all complex

42. Name the first country to launch the world's first 6G satellite named "UESTC" satellite (Star Era-12) to test communications from space.

- (A) China
- (B) United States (US)
- (C) Japan
- (D) France

43. A transient signal can be observed using a

- (A) Logic State Analyzer
- (B) Wave Analyzer
- (C) High Frequency Oscilloscope
- (D) Storage Oscilloscope

44. Assertion A : To design a high frequency amplifier, common base mode is preferred over common emitter mode.

Reason R : Feedback capacitance is smaller in common base mode.

- (A) Both 'A' and 'R' are true and 'R' is the correct reason for 'A'.
- (B) Both 'A' and 'R' are true but 'R' is not the correct reason for 'A'.
- (C) 'A' is true but 'R' is false.
- (D) 'A' is false but 'R' is true.

45. An amplitude modulated signal consists of the carrier frequency and two sidebands. Out of these, the minimum required to extract the modulating signal is

- (A) only one sideband
- (B) both the sidebands
- (C) one sideband and the carrier
- (D) both the sidebands and the carrier

46. The Lai Haraoba festival is observed in

- (A) Mizoram
- (B) Sikkim
- (C) Nagaland
- (D) Manipur

47. If the scattering matrix of a hybrid-T component is given by

$$S = \begin{bmatrix} S_{11} & S_{12} & S_{12} & X \\ S_{12} & S_{22} & S_{23} & S_{24} \\ S_{12} & S_{23} & S_{33} & -S_{24} \\ Y & S_{24} & -S_{24} & S_{44} \end{bmatrix}$$

then,

- (A)  $X = 0, Y = 0$
- (B)  $X = 0, Y = 1$
- (C)  $X = 1, Y = 0$
- (D)  $X = 1, Y = 1$

48. When was UN's International Day of Older Persons observed annually?

- (A) October 2
- (B) September 29
- (C) October 1
- (D) September 30

49. The amplitude of the signal

$$s = [\sqrt{3} \cos(\omega t) + 3 \sin(\omega t)]$$
 is

- (A)  $\sqrt{3}$
- (B) 3
- (C)  $2\sqrt{3}$
- (D)  $3 + \sqrt{3}$

Please Turn Over

50. If two continuous time signals  $\phi(t)$  and  $f(t)$  are related by  $\phi(t) = f(t - T)$ , then we can conclude that  $\phi(t)$  is

- (A) time delayed version of  $f(t)$ .
- (B) time advanced version of  $f(t)$ .
- (C) time compressed version of  $f(t)$ .
- (D) time elongated version of  $f(t)$ .

51. Amongst the following materials, skin depth at high frequencies is minimum in

- (A) Copper
- (B) Germanium
- (C) Silicon
- (D) Silicon dioxide

52. An example of White noise is

- (A) Thermal noise
- (B) Shot noise
- (C) Generation-recombination noise
- (D) Quantization noise

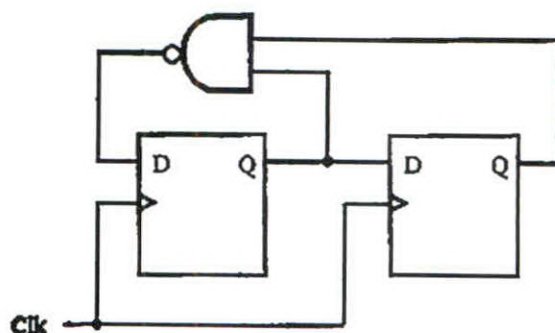
53. A network contains only current sources and resistors. If all the resistances in the network are doubled in value, then all the node voltages

- (A) will become half their original values.
- (B) remain unchanged.
- (C) will become double their original values.
- (D) cannot be determined unless the network configuration is known.

54. When a subroutine CALL instruction is executed in 8085 microprocessor, contents of its Program Counter is saved in

- (A) a pre-determined memory location
- (B) top of the stack
- (C) bottom of the stack
- (D) in the Stack Pointer

55.



For the counter circuit shown in the Figure above, the Counter State ( $Q_1Q_0$ ) will follow the sequence

- (A) 01,10,11,01,10, ...
- (B) 01,11,10,01,11, ...
- (C) 01,11,00,10,01, ...
- (D) 01,00, 11,10,01, ...

56. A Smith Chart is used in

- (A) Transmission line calculations
- (B) Logic circuit analysis
- (C) Control system design
- (D) Software engineering

57. Assertion A : A system whose output  $y(t)$  to an input  $x(t)$  is specified by  $y(t) = x(t - 2) + x(t + 2)$  is causal.

Reason R : A system whose output at any instant  $t_0$  depends only on the values of its input for  $t \leq t_0$  is causal.

- (A) Both 'A' and 'R' are true and 'R' is the correct reason for 'A'.
- (B) Both 'A' and 'R' are true but 'R' is not the correct reason for 'A'.
- (C) 'A' is true but 'R' is false.
- (D) 'A' is false but 'R' is true.

58. A Class-B push-pull amplifier can have a maximum efficiency of

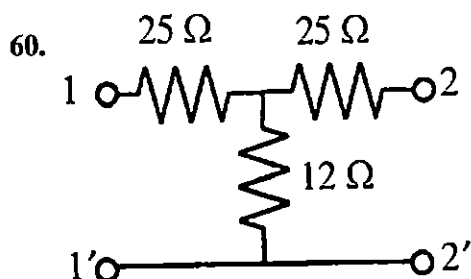
- (A) 10%
- (B) 25%
- (C) 50%
- (D) 75%



59. Assertion A : Silicon is predominantly used in VLSI technology.

Reason R : Silicon is an indirect band-gap semiconductor.

- (A) Both 'A' and 'R' are true and 'R' is the correct reason for 'A'.  
 (B) Both 'A' and 'R' are true but 'R' is not the correct reason for 'A'.  
 (C) 'A' is true but 'R' is false.  
 (D) 'A' is false but 'R' is true.



The characteristic impedance of the 2-port network shown in the figure above is

- (A) 25  $\Omega$   
 (B) 35  $\Omega$   
 (C) 45  $\Omega$   
 (D) 55  $\Omega$

61. An operational amplifier has differential gain of 2000 V/V and common mode gain of 0.2V/V. Its CMRR is

- (A) 20 dB  
 (B) 40 dB  
 (C) 60 dB  
 (D) 80 dB

62. The output of a linear system in response to any arbitrary input signal can be obtained from its impulse response by

- (A) convolution  
 (B) conformal transformation  
 (C) Fourier analysis  
 (D) Laplace transform

63. In a Silicon *p-n* junction diode, one side is doped with Boron to  $1.5 \times 10^{17}/\text{cm}^3$  and the other side with Phosphorous to  $1 \times 10^{19}/\text{cm}^3$ . When the diode is forward biased, across the junction

- (A) electron current is greater than hole current.  
 (B) hole current is greater than electron current.  
 (C) both electron and hole currents are equal.  
 (D) any of the above depending on the forward bias voltage.

64. Choose the correct option:

The students in our school are \_\_\_\_\_ in other school.

- (A) as good as  
 (B) good  
 (C) bad  
 (D) dance

65. What are the contents of the Accumulator (A) and the Register C after the following instructions are executed in an 8085 microprocessor?

START : MVIA, 36

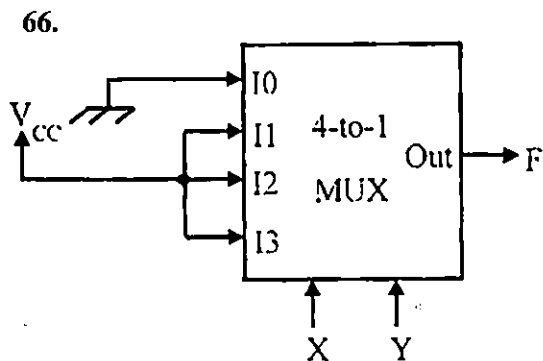
MOV C,A

RRC

ANAC

- (A) A = 36<sub>H</sub>, C = 36<sub>H</sub>  
 (B) A = 12<sub>H</sub>, C = 36<sub>H</sub>  
 (C) A = 36<sub>H</sub>, C = 12<sub>H</sub>  
 (D) A = 12<sub>H</sub>, C = 12<sub>H</sub>

Please Turn Over



The output 'F' of the above circuit is

- (A)  $X + Y$
- (B)  $X \cdot Y$
- (C)  $\bar{X} + Y$
- (D)  $\bar{X} \cdot Y$

67. The Laplace equation in electrostatics is given by

$$\nabla^2 V(\vec{r}) = 0$$

The solution to the Laplace equation in one-dimension is

- (A)  $V(x) = a \cdot e^{-bx}$
- (B)  $V(x) = a \cdot x^2 + b \cdot x + c$
- (C)  $V(x) = m \cdot x + c$
- (D)  $V(x) = a \cdot \log(-bx)$

68. The probability of error-free transmission of an  $n$ -bit packet through a channel with bit-error probability of  $\alpha$  is

- (A)  $1 - n\alpha$
- (B)  $n(1 - \alpha)$
- (C)  $1 - \alpha^n$
- (D)  $(1 - \alpha)^n$

69. One word substitute of the given words 'one who possesses many talents' is

- (A) Versatile
- (B) Wisdom
- (C) Clever
- (D) Draw

70. A Phase-Locked Loop is used to demodulate

- (A) AM signal
- (B) FM signal
- (C) PAM signal
- (D) PCM signal

71. Which of the following modes does not exist in a rectangular waveguide?

- (A)  $TE_{10}$
- (B)  $TM_{10}$
- (C)  $TE_{11}$
- (D)  $TM_{11}$

72. Fill in the blank with correct option:

"I don't like coffee." "\_\_\_\_\_ do it."

- (A) So
- (B) Neither
- (C) Either
- (D) No

73. A Colpitts oscillator uses

- (A) R-C ladder network
- (B) R-C bridge network
- (C) L-C network with a split inductor
- (D) L-C network with two capacitors and an inductor

74. A superheterodyne radio receiver designed to work with an intermediate frequency of 455 kHz is tuned to receive signal from a radio station broadcasting at 1,200 kHz. The associated image frequency is

- (A) 745 kHz.
- (B) 1,645 kHz.
- (C) 2,110 kHz.
- (D) 2,400 kHz.

75. On which river is the Ratle Hydropower project located?

- (A) Beas
- (B) Ravi
- (C) Chenub
- (D) Sutlej

76. To express a Boolean Logic expression in its minimal form

- (A) all Essential Prime Implicants are necessary and sufficient.
- (B) all Implicants are necessary and sufficient.
- (C) all Essential Prime Implicants are necessary.
- (D) all Implicants are necessary.

77. Choose the correct preposition:

Looking at the old photograph, he took a walk \_\_\_\_\_ the memory lane.

- (A) on
- (B) to
- (C) down
- (D) off

78. How many hardware interrupts are there in an 8085 microprocessor?

- (A) 3
- (B) 4
- (C) 5
- (D) 6

79. The MOS transistor in a small signal amplifier is operated in its

- (A) linear region
- (B) saturation region
- (C) cut-off region
- (D) any of the above depending on the signal

80. Change the voice:

Who stole your cycle?

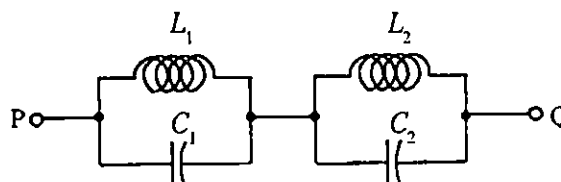
- (A) Your cycle was stolen by him?
- (B) The cycle was stolen.
- (C) By whom was your cycle stolen?
- (D) Did someone steal the cycle?

81. Replace the underlined idiomatic expression proverb with correct alternative:

The teachers were completely in the dark concerning the student's plans.

- (A) afraid
- (B) ignorant about
- (C) happy
- (D) sad

82.



In the above circuit,  $L_1C_1 \neq L_2C_2$  and  $L_1C_2 \neq L_2C_1$ . The reactance function between P and Q ( $X_{PQ}$ ) will have

- (A) 2 Poles and 1 Zero
- (B) 3 Poles and 2 Zeros
- (C) 2 Poles and 3 Zeros
- (D) 3 Poles and 4 Zeros

83. If a silicon sample is doped more and more p-type, the Fermi level will

- (A) come closer to the conduction band.
- (B) come closer to the valence band.
- (C) shift more towards the intrinsic level.
- (D) not change.

Please Turn Over

84. Choose the correct option:

Please, come \_\_\_\_\_ the classroom.

- (A) out of
- (B) over
- (C) on
- (D) in

85. Which Tiger Reserve received TX2 Tiger Conservation Awards 2020 for doubling the number of tigers in 4 years ahead of the target of 10 years?

- (A) Nagarjunsagar-Srisaïlam Tiger Reserve, Andhra Pradesh
- (B) Bor Tiger Reserve, Maharashtra
- (C) Amrabad Tiger Reserve, Hyderabad
- (D) Pilibhit Tiger Reserve, Uttar Pradesh

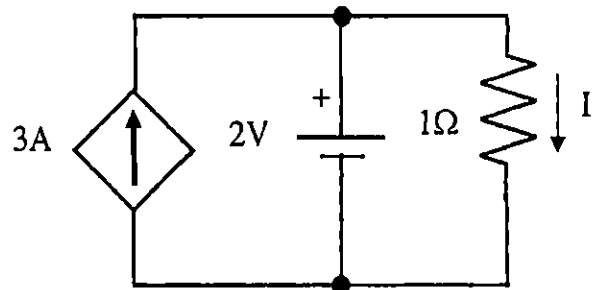
86. List-1 below gives the names of some materials and List-2 provides some values of band-gap energies.

<i>List-1</i>	<i>List-2</i>
1. Si	a. 0.67 eV
2. Ge	b. 1.11 eV
3. SiO <sub>2</sub>	c. 1.43 eV
4. GaAs	d. 2.26 eV
	e. 9eV

The correct matching between the materials and the band-gaps is

- |     |   |   |   |   |
|-----|---|---|---|---|
|     | 1 | 2 | 3 | 4 |
| (A) | a | b | c | d |
| (B) | b | a | e | c |
| (C) | a | c | d | b |
| (D) | b | a | d | c |

87.



The current 'I' flowing through the 1Ω resistance in the above circuit is

- (A) 1A
- (B) 2A
- (C) 3A
- (D) 5A

88. Change the voice:

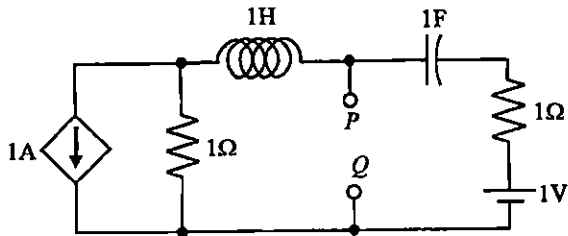
Never disobey your elders.

- (A) You are ordered not to disobey your elders.
- (B) You are asked not to disobey your elders.
- (C) It is good to obey your parents.
- (D) You cannot disobey your parents.

89. When the 'RESET IN' pin of an 8085 microprocessor is activated, the program execution jumps to

- (A) location 0000<sub>H</sub>
- (B) a subroutine
- (C) location FFFF<sub>H</sub>
- (D) address available in the HL register

90.



The Thevenin equivalent impedance  $Z_{th}(s)$  between the nodes  $P$  and  $Q$  in the above circuit is

- (A) 1
- (B)  $1 + s$
- (C)  $1 + 1/s$
- (D)  $2 + s + 1/s$

91. Where is the world's largest care and cure centre for elephants being set up in India?

- (A) Kerala
- (B) Meghalaya
- (C) Chhattisgarh
- (D) Odisha

92. Replace the underlined words with the correct option given below:

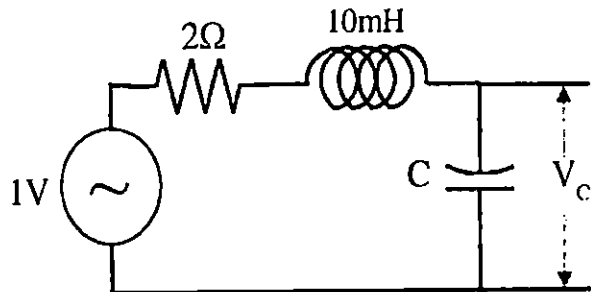
The owner of the house tried every trick in the book to sell the flat to my father, but failed.

- (A) ready to bargain
- (B) try every possible way
- (C) stop talking
- (D) judging someone

93. United Nations' (UN's) World Science Day for Peace and Development is observed on which date?

- (A) November 7
- (B) November 10
- (C) November 8
- (D) November 9

94.



The series LCR circuit shown in the figure above resonates at  $\omega = 1 \text{ k rad/sec}$ . The voltage  $V_c$  across the capacitance at resonance is

- (A) 0.5 V
- (B) 1 V
- (C) 2 V
- (D) 5 V

95. A current amplifier should have

- (A) low input impedance, high output impedance.
- (B) low input impedance, low output impedance.
- (C) high input impedance, low output impedance.
- (D) high input impedance, high output impedance.

96. The base-band signal in digital telephony is

- (A) 8 kbps
- (B) 16 kbps
- (C) 32 kbps
- (D) 64 kbps

97. Find out which part of the sentence has an error. If there is no mistake, the answer is 'No error'.

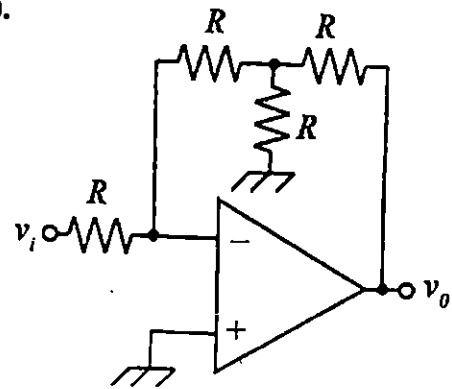
- (A) The road
- (B) to house
- (C) passes through a forest.
- (D) No error

Please Turn Over

98. Correct the given sentence grammatically:  
Adesh, who he is my best friend, is a dancer.
- (A) Adesh, who is my best friend, is a dancer.  
(B) A dancer Adesh will be my friend.  
(C) Adesh who is my best friend who is a dancer.  
(D) My friend Adesh is reportedly a dancer.

99. The signal  $s(t) = 2\sin^2(t) + 3\cos(2t)$  has frequency components
- (A) 0 and  $1/(2\pi)$  Hz.  
(B) 0 and  $1/\pi$  Hz.  
(C)  $1/(2\pi)$  and  $1/\pi$  Hz.  
(D) 0,  $1/(2\pi)$  and  $1/\pi$  Hz.

100.



Assuming the operational amplifier to be ideal, the gain of the amplifier circuit will be

- (A)  $-1 \text{ V/V}$   
(B)  $-2 \text{ V/V}$   
(C)  $-3 \text{ V/V}$   
(D)  $-4 \text{ V/V}$