Test Paper : **II**

Test Subject : **ELECTRONIC SCIENCE**

Test Subject Code : **K-3118**

Roll No. | | | | | | | | |

(Figures as per admission card)

OMR Sheet No. : _____

TEST BOOKLET SERIAL NO.

Name & Signature of Invigilator/s

Signature : _____

Name : _____

Time : 2 Hours | Maximum Marks : 200

Number of Pages in this Booklet : **24** | Number of Questions in this Booklet : **100**

ಅಭ್ಯರ್ಥಿಗಳಿಗೆ ಸೂಚನೆಗಳು

1. ಈ ಪುಟದ ಮೇಲ್ತುದಿಯಲ್ಲಿ ಒದಗಿಸಿದ ಸ್ಥಳದಲ್ಲಿ ನಿಮ್ಮ ರೋಲ್ ನಂಬರನ್ನು ಬರೆಯಿರಿ.
2. ಈ ಪತ್ರಿಕೆಯು ಬಹು ಆಯ್ಕೆ ವಿಧದ ನೂರು (100) ಪ್ರಶ್ನೆಗಳನ್ನು ಒಳಗೊಂಡಿದೆ.
3. ಪರೀಕ್ಷೆಯ ಪ್ರಾರಂಭದಲ್ಲಿ, ಪ್ರಶ್ನೆ ಪುಸ್ತಿಕೆಯನ್ನು ನಿಮಗೆ ನೀಡಲಾಗುವುದು. ಮೊದಲ 5 ನಿಮಿಷಗಳಲ್ಲಿ ನೀವು ಪುಸ್ತಿಕೆಯನ್ನು ತೆರೆಯಲು ಮತ್ತು ಕೆಳಗಿನಂತೆ ಕಡ್ಡಾಯವಾಗಿ ಪರೀಕ್ಷಿಸಲು ಕೋರಲಾಗಿದೆ.
   (i) ಪ್ರಶ್ನೆಪುಸ್ತಿಕೆಗೆ ಪ್ರವೇಶಾವಕಾಶ ಪಡೆಯಲು, ಈ ಹೊದಿಕೆ ಪುಟದ ಅಂಚಿನ ಮೇಲಿರುವ ಪೇಪರ್ ಸೀಲನ್ನು ಹರಿಯಿರಿ. ಸ್ಟಿಕ್ಕರ್ ಸೀಲ್ ಇಲ್ಲದ ಅಥವಾ ತೆರೆದ ಪುಸ್ತಿಕೆಯನ್ನು ಸ್ವೀಕರಿಸಬೇಡಿ.
   (ii) **ಪುಸ್ತಿಕೆಯಲ್ಲಿನ ಪ್ರಶ್ನೆಗಳ ಸಂಖ್ಯೆ ಮತ್ತು ಪುಟಗಳ ಸಂಖ್ಯೆಯನ್ನು ಮುಖಪುಟದ ಮೇಲೆ ಮುದ್ರಿಸಿದ ಮಾಹಿತಿಯೊಂದಿಗೆ ತಾಳೆ ನೋಡಿರಿ. ಪುಟಗಳು/ಪ್ರಶ್ನೆಗಳು ಕಾಣೆಯಾದ ಅಥವಾ ದ್ವಿಪ್ರತಿ ಅಥವಾ ಅನುಕ್ರಮವಾಗಿಲ್ಲದ ಅಥವಾ ಇತರ ಯಾವುದೇ ವ್ಯತ್ಯಾಸದ ದೋಷಪೂರಿತ ಪುಸ್ತಿಕೆಯನ್ನು ಕೂಡಲೆ 5 ನಿಮಿಷದ ಅವಧಿ ಒಳಗೆ, ಸಂವೀಕ್ಷಕರಿಂದ ಸರಿ ಇರುವ ಪುಸ್ತಿಕೆಗೆ ಬದಲಾಯಿಸಿಕೊಳ್ಳಬೇಕು. ಆ ಬಳಿಕ ಪ್ರಶ್ನೆಪತ್ರಿಕೆಯನ್ನು ಬದಲಾಯಿಸಲಾಗುವುದಿಲ್ಲ, ಯಾವುದೇ ಹೆಚ್ಚುಸಮಯವನ್ನೂ ಕೊಡಲಾಗುವುದಿಲ್ಲ.**
4. ಪ್ರತಿಯೊಂದು ಪ್ರಶ್ನೆಗೂ (A), (B), (C) ಮತ್ತು (D) ಎಂದು ಗುರುತಿಸಿದ ನಾಲ್ಕು ಪರ್ಯಾಯ ಉತ್ತರಗಳಿವೆ. ನೀವು ಪ್ರಶ್ನೆಯ ಎದುರು ಸರಿಯಾದ ಉತ್ತರದ ಮೇಲೆ, ಕೆಳಗೆ ಕಾಣಿಸಿದಂತೆ ಅಂಡಾಕೃತಿಯನ್ನು ಕಪ್ಪಾಗಿಸಬೇಕು.

   ಉದಾಹರಣೆ : (A) (B) ● (D)

   (C) ಸರಿಯಾದ ಉತ್ತರವಾಗಿದ್ದಾಗ.
5. ಈ ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯ ಜೊತೆಯಲ್ಲಿ **ಕೊಟ್ಟಿರುವ OMR ಉತ್ತರ ಹಾಳೆಯಲ್ಲಿ ನಿಮ್ಮ ಉತ್ತರಗಳನ್ನು ಸೂಚಿಸತಕ್ಕದ್ದು.** OMR ಹಾಳೆಯಲ್ಲಿ ಅಂಡಾಕೃತಿಯಲ್ಲದೆ ಬೇರೆ ಯಾವುದೇ ಸ್ಥಳದಲ್ಲಿ ಉತ್ತರವನ್ನು ಗುರುತಿಸಿದರೆ, ಅದರ ಮೌಲ್ಯಮಾಪನ ಮಾಡಲಾಗುವುದಿಲ್ಲ.
6. OMR ಉತ್ತರ ಹಾಳೆಯಲ್ಲಿ ಕೊಟ್ಟ ಸೂಚನೆಗಳನ್ನು ಜಾಗರೂಕತೆಯಿಂದ ಓದಿರಿ.
7. ಎಲ್ಲಾ ಕರಡು ಕೆಲಸವನ್ನು ಪುಸ್ತಿಕೆಯ ಕೊನೆಯಲ್ಲಿ ಮಾಡತಕ್ಕದ್ದು.
8. ನಿಮ್ಮ ಗುರುತನ್ನು ಬಹಿರಂಗಪಡಿಸಬಹುದಾದ ನಿಮ್ಮ ಹೆಸರು ಅಥವಾ ಯಾವುದೇ ಚಿಹ್ನೆಯನ್ನು, ಸಂಗತವಾದ ಸ್ಥಳ ಹೊರತು ಪಡಿಸಿ, OMR ಉತ್ತರ ಹಾಳೆಯ ಯಾವುದೇ ಭಾಗದಲ್ಲಿ ಬರೆದರೆ, ನೀವು ಅನರ್ಹತೆಗೆ ಬಾಧ್ಯರಾಗುತ್ತೀರಿ.
9. ಪರೀಕ್ಷೆಯು ಮುಗಿದನಂತರ, ಕಡ್ಡಾಯವಾಗಿ OMR ಉತ್ತರ ಹಾಳೆಯನ್ನು ಸಂವೀಕ್ಷಕರಿಗೆ ನೀವು ಹಿಂತಿರುಗಿಸಬೇಕು ಮತ್ತು ಪರೀಕ್ಷಾ ಕೊಠಡಿಯ ಹೊರಗೆ OMRನ್ನು ನಿಮ್ಮೊಂದಿಗೆ ಕೊಂಡೊಯ್ಯಕೂಡದು.
10. ಪರೀಕ್ಷೆಯ ನಂತರ, ಪರೀಕ್ಷಾ ಪ್ರಶ್ನೆಪತ್ರಿಕೆಯನ್ನು ಮತ್ತು ನಕಲು OMR ಉತ್ತರ ಹಾಳೆಯನ್ನು ನಿಮ್ಮೊಂದಿಗೆ ತೆಗೆದುಕೊಂಡು ಹೋಗಬಹುದು.
11. **ನೀಲಿ/ಕಪ್ಪು ಬಾಲ್‌ಪಾಯಿಂಟ್ ಪೆನ್ ಮಾತ್ರವೇ ಉಪಯೋಗಿಸಿರಿ.**
12. **ಕ್ಯಾಲ್ಕುಲೇಟರ್, ವಿದ್ಯುನ್ಮಾನ ಉಪಕರಣ ಅಥವಾ ಲಾಗ್ ಟೇಬಲ್ ಇತ್ಯಾದಿಯ ಉಪಯೋಗವನ್ನು ನಿಷೇಧಿಸಲಾಗಿದೆ.**
13. **ಸರಿ ಅಲ್ಲದ ಉತ್ತರಗಳಿಗೆ ಋಣ ಅಂಕ ಇರುವುದಿಲ್ಲ.**
14. **ಕನ್ನಡ ಮತ್ತು ಇಂಗ್ಲೀಷ್ ಆವೃತ್ತಿಗಳ ಪ್ರಶ್ನೆಪತ್ರಿಕೆಗಳಲ್ಲಿ ಯಾವುದೇ ರೀತಿಯ ವ್ಯತ್ಯಾಸಗಳು ಕಂಡುಬಂದಲ್ಲಿ, ಇಂಗ್ಲೀಷ್ ಆವೃತ್ತಿಗಳಲ್ಲಿರುವುದೇ ಅಂತಿಮವೆಂದು ಪರಿಗಣಿಸಬೇಕು.**

Instructions for the Candidates

1. Write your roll number in the space provided on the top of this page.
2. This paper consists of Hundred multiple-choice type of questions.
3. At the commencement of examination, the question booklet will be given to you. In the first 5 minutes, you are requested to open the booklet and compulsorily examine it as below :
   (i) To have access to the Question Booklet, tear off the paper seal on the edge of the cover page. Do not accept a booklet without sticker seal or open booklet.
   (ii) **Tally the number of pages and number of questions in the booklet with the information printed on the cover page. Faulty booklets due to pages/questions missing or duplicate or not in serial order or any other discrepancy should be got replaced immediately by a correct booklet from the invigilator within the period of 5 minutes. Afterwards, neither the Question Booklet will be replaced nor any extra time will be given.**
4. Each item has four alternative responses marked (A), (B), (C) and (D). You have to darken the circle as indicated below on the correct response against each item.

   Example : (A) (B) ● (D)

   where (C) is the correct response.
5. Your responses to the questions are to be indicated in the **OMR Sheet kept inside this Booklet.** If you mark at any place other than in the circles in the OMR Sheet, it will not be evaluated.
6. Read the instructions given in OMR carefully.
7. Rough Work is to be done in the end of this booklet.
8. If you write your name or put any mark on any part of the OMR Answer Sheet, except for the space allotted for the relevant entries, which may disclose your identity, you will render yourself liable to disqualification.
9. You have to return the test OMR Answer Sheet to the invigilators at the end of the examination compulsorily and must NOT carry it with you outside the Examination Hall.
10. You can take away question booklet and carbon copy of OMR Answer Sheet after the examination.
11. **Use only Blue/Black Ball point pen.**
12. **Use of any calculator, electronic gadgets or log table etc., is prohibited.**
13. **There is no negative marks for incorrect answers.**
14. **In case of any discrepancy found in the Kannada translation of a question booklet the question in English version shall be taken as final.**

ELECTRONIC SCIENCE
Paper – II

Note : This paper contains **hundred (100)** objective type questions. **Each** question carries **two (2)** marks. **All** questions are **compulsory**.

1. The MOSFET switch in its ON-State may be considered equivalent to

(A) Resistor

(B) Inductor

(C) Capacitor

(D) Linear active device

2. Why does the mobility of electrons in semiconductor decrease with increasing donor density ?

(A) Doping increases the effective mass of electrons

(B) Doping decreases the relaxation time of electrons

(C) More holes are generated so that effective mobility decreases

(D) Electrons are trapped by the donor

3. The h parameter of the circuit shown in the figure Q. No. 3 are

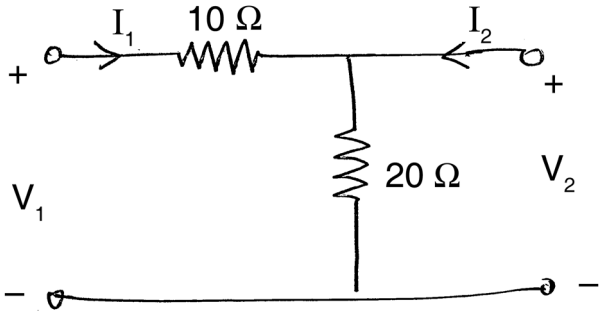


Figure Q. No. 3

(A) $\begin{bmatrix} 0.1 & 0.1 \\ -0.1 & 0.3 \end{bmatrix}$

(B) $\begin{bmatrix} 10 & -1 \\ 1 & 0.05 \end{bmatrix}$

(C) $\begin{bmatrix} 30 & 20 \\ 20 & 30 \end{bmatrix}$

(D) $\begin{bmatrix} 10 & 1 \\ -1 & 0.05 \end{bmatrix}$

4. A ramp voltage V(t) = 100 t volts, is applied to an RC differentiating circuit with R = 5 KΩ and C = 4 μF. The maximum output voltage is

(A) 0.2 volt

(B) 2.0 volt

(C) 10.0 volt

(D) 20 volt

5. Harmonic distortion in transistor amplifier arises due to

(A) Limited bandwidth

(B) Power exceeding its specification

(C) Dynamic range

(D) High h_{FE}

6. Bandwidth of an audio amplifier means

(A) Frequency range between – 3dB points

(B) Frequency range between – 0dB points

(C) Frequency range between – 6dB points

(D) Frequency range between + 3dB points

7. Simplified expression of

$f(x, y, z) = (x + y)(x + yz) + x'y' + x'z'$ is

(A) 0

(B) 1

(C) $x + z$

(D) $x + y'$

8. Knowledge of propagation delay is important because

(A) the logic gates must be given a short break during each clock cycle or else they will overheat

(B) it limits the maximum operating frequency of gate

(C) it is measure of how long the clock must be applied to the gate before it will make the required decision

(D) all the gates in a system must have the same propagation times in order to be compatible

9. The register which holds the information about the nature of results of arithmetic and logical operations is called as

(A) Accumulator

(B) Condition code register

(C) Flag register

(D) Process status register

10. Which one of the following is not a vectored interrupt ?

(A) TRAP

(B) INTR

(C) RST 7.5

(D) RST 5.5

11. Which is the correct sequence statements that swaps values of two variables ?

(A) a = a + b; a = a – b; b = a – b

(B) a = a + b; b = a – b; a = a – b

(C) a = a – b; a = a + b; b = b – a

(D) a = b – a; a = a – b; b = b – a

12. Given float *pf; int *pi; which of the following is true ?

(A) size of (pf) > size of (pi)

(B) size of (pi) < size of (pf)

(C) size of (pf) = = size of (pi)

(D) depends on compiler

13. Which ionosphere layer is responsible for return of radiation at frequency of 32 MHz ?

(A) E

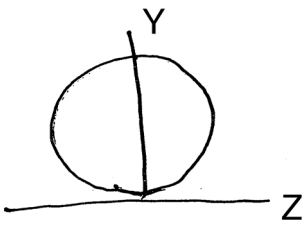
(B) F

(C) G

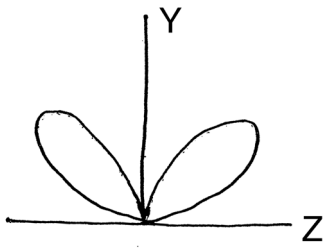
(D) D

14. A λ /2 dipole is kept horizontally at a height of λ_0 /2 above perfectly conducting infinite ground plane. The radiation pattern in the plane of the dipole ($\bar{E}$ plane) looks approximately as

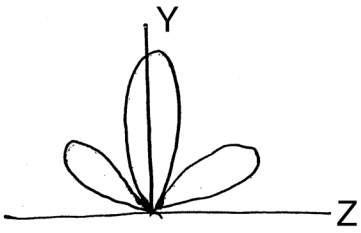
(A)



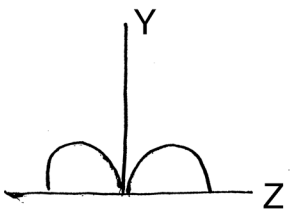
(B)



(C)



(D)



15. The bit stream 01001 is differentially encoded using 'Delay and EX-OR' scheme for DPSK transmission. Assuming the reference bit as a '1' and assigning phases of '0°' and 'π' for 1's and 0's respectively in the encoded sequence, the transmitted phase sequence becomes

(A) 0° π π π 0°

(B) 0° π π 0° 0°

(C) π 0° π π 0°

(D) π π 0° π π

16. The noise figure of an amplifier is 7 dB. What is the output signal to noise ratio when the input signal to noise ratio is 35 dB ?

(A) 5 dB

(B) 20 dB

(C) 28 dB

(D) 35 dB

17. If I_{CO1} and I_{CO2} are the different leakage currents, then the expression for anode current I_A in conduction mode of a SCR is

(A) $I_A = (I_{CO1} - I_{CO2})/(1 + h_{FE2})$

(B) $I_A = (1 - h_{FE1})\,(1 + h_{FE2})\,(I_{CO1} + I_{CO2})/(1 + h_{FE2})$

(C) $I_A = (I_{CO1} - I_{CO2})\,(1 + O^+)/(1 - O^+)$

(D) $I_A = \dfrac{4(I_{CO1} + I_{CO2})}{O^+}$

18. Intrinsic stand-off ratio "η" of a UJT is

(A) $\dfrac{R_{B1}}{R_{B2} + V_{BB}}$

(B) $\dfrac{R_{B1}}{R_{B1} + R_{B2}}$

(C) $\dfrac{V_{BB}}{V_E + V_{BB}}$

(D) $\dfrac{R_{B1}}{R_{B2}}$

19. X-ray lasers are difficult to fabricate because

(A) Non-availability of mirrors

(B) No optical pump sources

(C) High threshold condition

(D) Limited availability of high voltage and current power supplies

20. Intrinsic region in P-i-N photodiode has following advantage

(A) Increases the depletion region

(B) Increases the spectral response

(C) Decreases the drift time

(D) Increases the speed of response

21. Which of the following devices are used for level to force conversion ?

(A) Load cell

(B) Membrane

(C) Diaphragm

(D) Voltmeter

22. The common mode error voltage in a DVM can be eliminated by using _____ at its input.

(A) Tuned amplifier

(B) A wide band amplifier

(C) A differential amplifier

(D) A low pass filter

23. How many roots with positive real parts do the equation $s^3 + s^2 - s + 1 = 0$ have ?

(A) Zero

(B) One

(C) Two

(D) Three

24. If the system is represented by characteristic equation $s^6 + s^4 + s^3 + s^2 + s + 3 = 0$, then the system is

(A) stable

(B) unstable

(C) marginally stable

(D) unpredictable

25. The impulse response of LTI system is given as e^{-t} for $t > 0$. Therefore, the transfer function is equal to

(A) $\frac{1}{s(s-1)}$

(B) $\frac{1}{s(s+1)}$

(C) $\frac{1}{s+1}$

(D) $\frac{1}{s-1}$

26. Impurity diffusion is used in semiconductor to control the conductivity. The nature of the impurity profile should be such that the impurity concentration decreases with diffusion depth. Consider the following statements :

a. Impurity concentration decreases with diffusion depth.

b. Profile results in an internal electrical field.

c. Impurity concentration is homogeneous with no internal electric field.

Which of the statements given above are correct ?

(A) a, b and c

(B) a and b

(C) b and c

(D) a and c

27. Consider the following statements :

a. BJT is a current controlled device with very high input impedance and high gain bandwidth.

b. FET is a voltage controlled device with high input impedance and low gain bandwidth.

c. UJT is a negative resistance device and can be used as oscillator.

d. BJT, FET and UJT can all be used for amplification.

Which of the statements given above are correct ?

(A) a and b

(B) c and d

(C) b and c

(D) a and d

28. For a two-port network to be reciprocal

a. $z_{11} = z_{22}$

b. $y_{21} = y_{12}$

c. $h_{21} = - h_{12}$

d. $AD - BC = 0$

(A) a and b

(B) b and d

(C) b and c

(D) a, b and d

29. Which of the following is/are correct with respect to relation between energy and charge ?

a. Energy = voltage/charge.

b. Energy = voltage × current × time.

c. Energy = voltage × ½ charge.

d. Energy = voltage × charge.

(A) b

(B) a and b

(C) c and d

(D) b and d

30. The disadvantages of collector to base bias in a transistor amplifier are

a. variation of input resistance with temperature

b. decrease of bandwidth

c. reduced power dissipation

d. reduced output

Which of the above statements are true ?

(A) b, c and d

(B) a and d

(C) c and d

(D) b and c

31. Following types of amplifier stages are seen in a common op-amp

a. common emitter amplifier

b. differential amplifier

c. class B amplifier

d. common base amplifier

Which of the above are true ?

(A) a and b

(B) b and c

(C) b, c and d

(D) a, b and c

32. Which of the following ADC's use stair case concept in its operation ?

a. counting type

b. SAR type

c. flash

d. tracking type

(A) a and d

(B) a and b

(C) a

(D) b and c

33. Following are the logic devices

a. 7406

b. 7432

c. 7413

d. 7414

Which of the above belong to Schmitt trigger ?

(A) a and b

(B) b and c

(C) a, b, c and d

(D) c and d

34. Which of the following is/are true with respect to 8251 ?

a. full duplex, double buffered transmitter and receiver

b. full duplex, single buffered transmitter and receiver

c. supports 19.2 K baud

d. programmed using 8 bit control word

(A) a and d

(B) b and c

(C) a and c

(D) a, c and d

35. Which of the following segment register/s of 8086 can be used to access data from memory ?

a. CS

b. DS

c. ES

d. SS

(A) b and c

(B) a and d

(C) b, c and d

(D) a, b, c and d

36. Which of the following is/are true with respect to double floating point data type ?

a. 23 bit for fractional part with implied 1 before the fractional part

b. 23 bit for fractional part with explicit 1 before the fractional part

c. 52 bit for fractional part with implied 1 before the fractional part

d. 52 bit for fractional part with explicit 1 before the fractional part

(A) a and c

(B) b and d

(C) a

(D) c

37. Which of the following are derived data types ?

a. array

b. pointer

c. structure

d. class

(A) a and b

(B) a, b and c

(C) c and d

(D) a

38. Consider the following statements :

If the narrow dimension of a standard rectangular waveguide carrying the dominant mode is reduced, then

a. wave impedance will increase

b. attenuation will increase

c. guide wavelength will decrease

d. power handling capability will decrease

Which of the statements given above are correct ?

(A) a and b

(B) b and d

(C) c and d

(D) a and c

39. Consider the following statements :

For a square waveguide of cross section 3 m × 3 m, it has been found

a. At 6 GHz dominant mode will propagate.

b. At 4 GHz all the modes are evanescent.

c. At 11 GHz only dominant modes and no higher order mode will propagate.

d. At 7 GHz degenerate modes will propagate.

Which of the above statements are correct ?

(A) b and c

(B) a, b and d

(C) a and b

(D) b, c and d

40. Consider the following codes :

a. Hamming code

b. Huffmann code

c. Prefix code

d. Convolutional code

Which of these are source codes ?

(A) b and c

(B) a and b

(C) c and d

(D) a, b, c and d

41. Consider the following statements :

a. Fourier transform is a special case of Laplace transform.

b. Region of convergence need not be specified for Fourier transform.

c. Laplace transform is not unique unless the region of convergence is specified.

d. Laplace transform is a special case of Fourier transform.

Which of the above statements are correct ?

(A) b and d

(B) d and a

(C) b, c and d

(D) a, b and c

42. Consider the following statement :

The overlap angle of phase controlled converter would increase on increasing the

a. Supply voltage

b. Supply frequency

c. Load current

d. Source inductance

Which of the above are correct ?

(A) b, c and d

(B) a, b and c

(C) a, b and d

(D) a, c and d

43. A two quadrant dc to dc chopper can operate with which of the following load condition ?

a. positive voltage, positive current

b. negative voltage, positive current

c. negative voltage, negative current

d. positive voltage, negative current

Choose correct answers from the above :

(A) a and b

(B) b and c

(C) a and d

(D) a, b and d

44. PID controllers are not normally used for following applications

a. Power control for a.c. units

b. Power control for incubators

c. Power control for TV's

d. Power control for crystal growth furnace

Which of the above statements are correct ?

(A) b and c

(B) a and c

(C) a and d

(D) c and d

45. Consider the following appliances :

a. Fan regulator

b. Electric ovens

c. Refrigerators

d. Room heaters

Which of the above are open loop control systems ?

(A) a and d

(B) b and c

(C) c and d

(D) a, b and d

46. Match the following :

List – I (Material)	**List – II (Band energy gap)**
a. Metal	i. 9 eV
b. Semi metal	ii. 0.05 eV
c. Semiconductor	iii. 1.5 eV
d. Insulator	iv. 0 or less

Codes :

	a	**b**	**c**	**d**
(A)	iv	i	ii	iii
(B)	iv	ii	iii	i
(C)	i	ii	iv	iii
(D)	iii	ii	iv	i

47. Match the following :

List – I	List – II
a. n-channel JFET is better than P-channel JFET	i. Reverse bias increases along the channel
b. Channel is wedge shaped	ii. High electric field near the drain and directed towards source
c. Channel is not completely closed at pinch-off	iii. Low leakage current at the gate terminal
d. Input impedance is high	iv. Better frequency performance since $\mu_n >> \mu_p$

Codes :

	a	b	c	d
(A)	iv	i	ii	iii
(B)	iv	ii	i	iii
(C)	i	ii	iv	iii
(D)	iii	ii	iv	i

48. Match the following :

List – I	List – II
a. $L^{-1}\left\{\frac{5!}{s(s+1)(s+2)(s+3)(s+4)(s+5)}\right\}$	i. t^5
b. $L^{-1}\left\{\frac{s+1}{s^2+2s}\right\}$	ii. $\frac{1}{5}\left[1+\frac{1}{2}e^t(-2\cos 2t+\sin 2t)\right]$
c. $L^{-1}\left\{\frac{5!}{s^6}\right\}$	iii. $(1-e^{-t})^5$
d. $L^{-1}\left\{\frac{1}{s(s^2-2s+5)}\right\}$	iv. $\frac{1}{2}(1+e^{-2t})$

Codes :

	a	b	c	d
(A)	ii	i	iv	iii
(B)	iii	i	iv	ii
(C)	ii	iii	i	iv
(D)	iii	iv	i	ii

49. Match the following lists with respect to the circuit shown in figure Q. No. 49

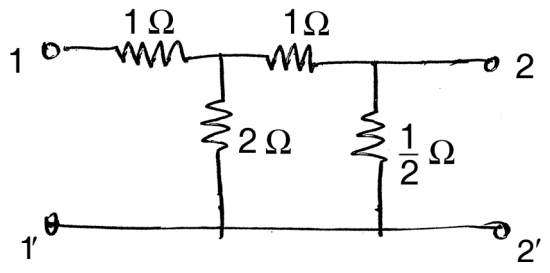


Figure Q. No. 49

List – I	List – II
a. y_{11}	i. $13/7$
b. y_{12}	ii. $-3/5$
c. z_{11}	iii. $2/7$
d. z_{12}	iv. $-2/5$

Codes :

	a	b	c	d
(A)	iv	ii	iii	i
(B)	ii	i	iv	iii
(C)	ii	iv	i	iii
(D)	iii	i	iv	ii

50. Match the following :

List – I	List – II
a. Current series feedback	i. Input resistance decreases
b. Voltage series feedback	ii. Bandwidth increases
c. Voltage shunt feedback	iii. Input resistance increases
d. Current shunt feedback	iv. Output resistance decreases

Codes :

	a	b	c	d
(A)	ii	iii	iv	i
(B)	iv	i	iii	ii
(C)	iii	i	iv	ii
(D)	iv	ii	iii	i

51. Match the following :

List – I	List – II
a. Class 'C' amplifier	i. Matched pair transistors
b. Class 'B' amplifier	ii. Low efficiency
c. Class 'A' amplifier	iii. Current amplifier
d. Common collector amplifier	iv. Transmitter application

Codes :

	a	b	c	d
(A)	ii	iii	iv	i
(B)	iv	ii	iii	i
(C)	iv	i	ii	iii
(D)	i	iv	ii	iii

52. Match the following :

List – I	List – II
a. 4 to 1 multiplexer	i. Sequential circuit decoder
b. Bistable Multivibrator	ii. Square wave circuit
c. Schmitt trigger	iii. Combinational circuit
d. 4-bit shift register	iv. Divider

Codes :

	a	b	c	d
(A)	iii	iv	i	ii
(B)	iii	iv	ii	i
(C)	i	iii	ii	iv
(D)	iii	i	ii	iv

53. Match the following :

List – I	List – II
a. EPROM	i. Fastest converter
b. Flash converter	ii. AND gate permanently hard wired OR gate programmable
c. Semiconductor memory	iii. Maximum conversion time = N bits
d. Successive approximation	iv. Combinational logic

Codes :

	a	b	c	d
(A)	ii	i	iv	iii
(B)	ii	i	iii	iv
(C)	i	iii	ii	iv
(D)	iv	iii	i	ii

54. Match the following :

List – I	List – II
a. mode 0	i. Hardware triggered strobe
b. mode 2	ii. Rate generator
c. mode 4	iii. Interrupt on terminal count
d. mode 5	iv. Software triggered strobe

Codes :

	a	b	c	d
(A)	iii	i	iv	ii
(B)	ii	iii	iv	i
(C)	iii	ii	i	iv
(D)	iii	ii	iv	i

55. Match the following :

List – I	List – II
a. LXI F800H	i. Direct addressing mode
b. STA F800H	ii. Implicit addressing mode
c. ADD M	iii. Immediate addressing mode
d. DAA	iv. Indirect addressing mode

Codes :

	a	b	c	d
(A)	i	iii	iv	ii
(B)	iii	iv	i	ii
(C)	iii	i	iv	ii
(D)	i	iii	ii	iv

56. Match the following :

List – I	List – II
a. sqrt ( )	i. long
b. rand ( )	ii. void
c. srand ( )	iii. int
d. time ( )	iv. double

Codes :

	a	b	c	d
(A)	iv	ii	iii	i
(B)	iv	iii	ii	i
(C)	iii	ii	i	iv
(D)	iii	i	ii	iv

57. Match the following :

List – I	List – II
a. double	i. 2 bytes
b. int	ii. 4 bytes
c. float	iii. 8 bytes
d. long double	iv. 10 bytes

Codes :

	a	b	c	d
(A)	ii	iii	i	iv
(B)	iii	i	iv	ii
(C)	iii	ii	i	iv
(D)	iv	i	iii	ii

58. Match the following :

List – I	List – II
a. Reflex Klystron	i. Amplifier
b. Two-cavity Klystron	ii. Mode jumping Klystron
c. Gun diode	iii. Oscillator
d. Magnetron	iv. Negative resistance

Codes :

	a	b	c	d
(A)	iii	i	ii	iv
(B)	i	iii	ii	iv
(C)	iii	i	iv	ii
(D)	ii	iii	iv	i

59. Match the following :

List – I	List – II
a. Line charge	i. Maxwell's equation
b. Magentic flux density	ii. Poynting vector
c. Displacement Current	iii. Biot-Savart's law
d. Power flow	iv. Gauss's law

Codes :

	a	b	c	d
(A)	i	iv	iii	ii
(B)	iv	iii	ii	i
(C)	i	iii	ii	iv
(D)	iv	iii	i	ii

60. Match the following :

List – I (Modulation Reception Techniques)	List – II (Disadvantages)
a. Super heterodyne	i. Threshold effect equation
b. FM	ii. Granular noise
c. PCM	iii. Image frequency interference
d. Delta modulation	iv. Quantisation noise

Codes :

	a	b	c	d
(A)	iii	i	ii	iv
(B)	iii	i	iv	ii
(C)	iii	ii	i	iv
(D)	iv	iii	ii	i

61. Match the following :

List – I	List – II
a. Companding	i. Improving image rejection
b. Squelch	ii. Variation of step size in quantisation
c. Pre-emphasis	iii. Muting the receiver
d. Double conversion	iv. Boosting of higher modulating frequency at the transmitter

Codes :

	a	b	c	d
(A)	ii	iii	iv	i
(B)	ii	iii	i	iv
(C)	iii	i	ii	iv
(D)	i	ii	iv	iii

62. Match the following :

List – I	List – II
a. Chopper	i. Firing circuit
b. Inverter	ii. Fan regulator
c. AC voltage controller	iii. UPS
d. UJT	iv. DC motor

Codes :

	a	b	c	d
(A)	ii	iii	i	iv
(B)	iii	ii	iv	i
(C)	iv	iii	ii	i
(D)	i	ii	iii	iv

63. Match the following :

List – I	List – II
a. Single mode fiber	i. No modes in the axis
b. Multimode fiber	ii. High attenuation
c. Graded index fiber	iii. Low bandwidth
d. PCS fiber	iv. Long distance communication

Codes :

	a	b	c	d
(A)	iii	ii	iv	i
(B)	iv	iii	i	ii
(C)	iv	i	ii	iii
(D)	i	ii	iii	iv

64. Match the following :

List – I	List – II
a. Capacitive transducer	i. Pressure
b. Thermocouple	ii. Torque
c. Load cell	iii. Displacement
d. Diaphragm	iv. Temperature

Codes :

	a	b	c	d
(A)	ii	iv	iii	i
(B)	iii	i	ii	iv
(C)	ii	i	iii	iv
(D)	iii	iv	ii	i

65. Match the following :

List – I	List – II
a. Stability	i. Transient analysis
b. y-Parameter	ii. Discrete time domain analysis
c. Laplace transform	iii. Hybrid π model
d. z-transform	iv. Location of poles

Codes :

	a	b	c	d
(A)	iv	iii	i	ii
(B)	iv	iii	ii	i
(C)	iv	ii	iii	i
(D)	i	ii	iii	iv

66. Consider the following steps :

a. Etching

b. Exposure to UV radiation

c. Stripping

d. Developing

After a water has been coated with photoresist, the correct sequence of these steps in photolithography is

(A) b, d, c, a

(B) b, d, a, c

(C) d, b, a, c

(D) c, b, a, d

67. Arrange the following h-parameters in the order they appear in h-parameter equivalent circuit from output port to input port.

a. hf

b. hr

c. hi

d. ho

(A) c, b, a, d

(B) c, a, b, d

(C) d, b, a, c

(D) d, a, b, c

68. Arrange the different stages in a op-amp from input side to output side.

a. push-pull amplifier

b. voltage amplifier

c. differential amplifier

d. phase splitter

(A) c, b, d, a

(B) c, b, a, d

(C) a, d, b, c

(D) a, b, d, c

69. Consider the following :

a. TTLL

b. CMOS 4000

c. CMOS 74 HC

d. ECL

Arrange the maximum flip-flop toggle frequency in decreasing order.

(A) a, b, c, d

(B) a, b, d, c

(C) d, c, b, a

(D) d, c, a, b

70. Arrange the following instructions in descending order of number of machine cycles.

a. SHLD

b. ADDM

c. JNC

d. LDA

(A) b, c, d, a

(B) a, d, c, b

(C) a, d, b, c

(D) d, a, c, b

71. Identify the correct sequence of steps to execute a program.

a. link

b. load

c. compile

d. execute

(A) c, b, a, d

(B) c, a, b, d

(C) b, a, c, d

(D) b, a, d, c

72. Consider the subsystems of Klystron amplifier

a. Buncher cavity

b. Cathode

c. Collector

d. Catcher cavity

Arrange the correct sequence, which appear in the direction of flow of the electron beam.

(A) a, b, d, c

(B) b, a, c, d

(C) b, a, d, c

(D) d, c, b, a

73. Following are the communication services

a. Telephone

b. Wide band FM

c. TV

d. AM broadcast

Arrange the bandwidth of the communication service in decreasing order.

(A) c, b, a, d

(B) a, c, b, d

(C) c, a, b, d

(D) c, b, d, a

74. Arrange following optical sources in increasing order of temporal coherence.

a. Edge emitting LED

b. Surface emitting LED

c. Sodium lamp

d. Vehicle headlight

(A) d, c, b, a

(B) d, b, c, a

(C) c, b, d, a

(D) a, c, b, d

75. Arrange the order of controllers in increasing order of controlling accuracy.

a. P control

b. ON-OFF control

c. PID control

d. PI control

(A) a, b, c, d

(B) c, d, a, b

(C) b, a, c, d

(D) b, a, d, c

Directions : Questions 76 to 95.

The following items consist of two statements, one labelled as "**Assertion (A)**" and the other labelled as "**Reason (R)**". You have to examine the two statements carefully and decide if the **Assertion (A)** and the **Reason (R)** are individually true and if so whether the reason is a correct explanation of the assertion. Select your answer to these items using the codes given below and mark your answer accordingly.

Codes :

(A) Both (A) and (R) are true and (R) is the correct explanation of (A)

(B) Both (A) and (R) are true, but (R) is not the correct explanation of (A)

(C) (A) is true, but (R) is false

(D) (A) is false, but (R) is true

76. **Assertion (A)** : A tunnel diode has an extremely thin depletion layer.

Reason (R) : A tunneling phenomenon occurs when a very heavily doped junction is reverse biased.

77. **Assertion (A)** : The semiconductor material used in making an optical source should be a direct band gap material.

Reason (R) : Carrier recombination time is shorter in a direct band gap semiconductor.

78. **Assertion (A)** : Laplace transformation solves differential equation systematically and incorporates both transient and steady state as well as the initial conditions.

Reason (R) : Laplace transform provides direct solution of non-homogeneous differential equation.

79. **Assertion (A)** : A 10 Ω resistor, a 1 H inductor and 1 μF capacitor are connected in parallel. The combination is driven by a unit step current, under the steady state condition, the source current flows through the resistor.

Reason (R) : Under steady state condition, the capacitor act like a open circuit and inductor short circuit.

80. **Assertion (A)** : Op-amp has virtual ground.

Reason (R) : Op-amp has high CMRR.

81. **Assertion (A)** : Phase locked loop can be used for frequency doubling.

Reason (R) : Phase locked loop have a multiplier block in their design.

82. **Assertion (A)** : ECL gates consume high power as compared to TTL gates.

Reason (R) : The transistor in ECL gates always work in active region.

83. **Assertion (A)** : Schottky TTL gates improve power dissipation capacity of the device.

Reason (R) : Schottky logic gates reduce the saturation of transistors.

84. **Assertion (A)** : 8259 A is used to arbitrate among interrupts in microprocessor system.

Reason (R) : In cascaded mode, 8259 A can handle 64 interrupts.

85. **Assertion (A)** : CALL instruction of 8085 microprocessor replaces PC by address of the subroutine to be called after saving current contents of PC.

Reason (R) : At the end of subroutine return statement/instruction is used.

86. **Assertion (A)** : Values should not be assigned to an array element whose subscript is equal to the size of an array.

Reason (R) : The programme may crash, if some important data gets over written.

87. **Assertion (A)** : C has built in multiway decision making statement known as a switch.

Reason (R) : The switch statement test the value of expression against list of case value and if match found, a block of associated statement is executed.

88. **Assertion (A)** : In microwave communication links, the rain-drop attenuation is experienced.

Reason (R) : Size of the rain drop become comparable to the wavelength of the signal.

89. **Assertion (A)** : K_U Band is prefered mode of communication for broadcasting TV signals to home.

Reason (R) : At high frequencies, the antenna size is indepedent.

90. **Assertion (A)** : Pulse broadening is a phenomenon associated with multi mode fibers.

Reason (R) : Material dispersion occurs when the phase velocity varies non-linearly with wavelength.

91. **Assertion (A)** : Majority of the carrier telephone systems use TDM.

Reason (R) : A TDM system has the capability of achieving much higher S/N ratio.

92. **Assertion (A)** : It is easier to construct optical transmitter using LED light source as compared to microwave devices.

Reason (R) : LED based transmitter use direct modulation principle.

93. **Assertion (A)** : V-number in a optical fiber decides the amount of light that can be coupled in the fiber.

Reason (R) : V-number is proportional to wavelength of operation.

94. **Assertion (A)** : Piezoelectric transducers require non-centro-symmetrical crystals or ceramics.

Reason (R) : Sodium chloride in the crystalline form is a good piezoelectric material.

95. **Assertion (A)** : Hall effect can be observed in all Group -IV compounds.

Reason (R) : Hall effect can be observed in doped silicon.

Based on the following paragraph answer Q. No. 96-100 :

The propagation of light along a waveguide can be described in terms of a set of guided electromagnetic waves called the *modes* of the waveguide. These guided modes are referred to as the *bound* or *trapped* modes of the waveguide. Each guided mode is a pattern of electric and magnetic field lines that is repeated along the fiber at intervals equal to the wavelength. Only a certain discrete number of modes are capable of propagating along the guide. These modes are those electromagnetic waves that satisfy the homogeneous wave equation in the fiber and the boundary condition at the waveguide surfaces.

96. Which of the following optical fiber has highest data rate ?

(A) Multimode silica fiber

(B) PCS fiber

(C) Single mode silica fiber

(D) Graded index optical fiber

97. The parameter used for specifying a single mode fiber is

(A) Numerical aperture

(B) V-number

(C) Angle of acceptance

(D) Refractive index

98. Which of the following optical fiber does not have a constant core refractive index ?

(A) Single mode fiber

(B) Graded index fiber

(C) Multimode fiber

(D) PCS fiber

99. An optical fiber has numerical aperture of 0.5 and radius of 10 μm to be used for communication using LED with emission wavelength 1 μm. Number of modes supported by the optical fiber are

(A) 100

(B) 253

(C) 493

(D) 656

100. Which mode among the following is supported by single mode fiber ?

(A) TE_{01}

(B) TM_{01}

(C) HE_{21}

(D) HE_{11}

ಚಿತ್ತು ಬರಹಕ್ಕಾಗಿ ಸ್ಥಳ

Space for Rough Work

ಚಿತ್ತು ಬರಹಕ್ಕಾಗಿ ಸ್ಥಳ
Space for Rough Work