

Test Paper : III  
Test Subject : ELECTRONIC SCIENCE  
Test Subject Code : K-3113

Test Booklet Serial No. : \_\_\_\_\_

OMR Sheet No. : \_\_\_\_\_

Roll No. 

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(Figures as per admission card)

Name & Signature of Invigilator/s

Signature: \_\_\_\_\_  
Name : \_\_\_\_\_

Signature: \_\_\_\_\_  
Name : \_\_\_\_\_

Paper : III  
Subject : ELECTRONIC SCIENCE

Time : 2 Hours 30 Minutes

Maximum Marks : 150

Number of Pages in this Booklet : 16

Number of Questions in this Booklet : 75

ಅಭ್ಯರ್ಥಿಗಳಿಗೆ ಸೂಚನೆಗಳು

- ಈ ಪುಟದ ಮೇಲ್ಭಾಗದಲ್ಲಿ ಒದಗಿಸಿದ ಸ್ಥಳದಲ್ಲಿ ನಿಮ್ಮ ರೋಲ್ ನಂಬರನ್ನು ಬರೆಯಿರಿ.
- ಈ ಪತ್ರಿಕೆಯು ಬಹು ಆಯ್ಕೆ ವಿಧದ ಪ್ರಶ್ನೆಗಳನ್ನು ಒಳಗೊಂಡಿದೆ.
- ಪರೀಕ್ಷೆಯ ಪ್ರಾರಂಭದಲ್ಲಿ ಪ್ರಶ್ನೆಪುಸ್ತಕವನ್ನು ನಿಮಗೆ ನೀಡಲಾಗುವುದು. ಮೊದಲ 5 ನಿಮಿಷಗಳಲ್ಲಿ ನೀವು ಪುಸ್ತಕವನ್ನು ತೆರೆಯಲು ಮತ್ತು ಕೆಳಗಿನಂತೆ ಕಡ್ಡಾಯವಾಗಿ ಪರೀಕ್ಷಿಸಲು ಕೋರಲಾಗಿದೆ.  
(i) ಪ್ರಶ್ನೆಪುಸ್ತಕದ ಪ್ರವೇಶಾಪಕ ಪಡೆಯಲು, ಈ ಹೊದಿಕೆ ಪುಟದ ಅಂಚಿನ ಮೇಲಿರುವ ಪೇಪರ್ ಸೀಲನ್ನು ಹರಿಯಿರಿ. ಸ್ವಿಚ್ ಸೀಲ್ ಇಲ್ಲದ ಪ್ರಶ್ನೆಪುಸ್ತಕ ಸ್ವೀಕರಿಸಬೇಡಿ. ತೆರದ ಪುಸ್ತಕವನ್ನು ಸ್ವೀಕರಿಸಬೇಡಿ.  
(ii) ಪುಸ್ತಕಿಯಲ್ಲಿನ ಪ್ರಶ್ನೆಗಳ ಸಂಖ್ಯೆ ಮತ್ತು ಪುಟಗಳ ಸಂಖ್ಯೆಯನ್ನು ಮುಖಪುಟದ ಮೇಲೆ ಮುದ್ರಿಸಿದ ಮಾಹಿತಿಯೊಂದಿಗೆ ತಾಳೆ ನೋಡಿರಿ. ಪುಟಗಳು/ಪ್ರಶ್ನೆಗಳು ಕಾಣೆಯಾದ, ಅಥವಾ ದ್ವಿಪುಟ ಅಥವಾ ಅನುಕ್ರಮವಾಗಿಲ್ಲದ ಅಥವಾ ಇತರ ಯಾವುದೇ ವ್ಯತ್ಯಾಸದ ದೋಷಪೂರಿತ ಪುಸ್ತಕವನ್ನು ಕೂಡಲೆ ನಿಮಿಷದ ಅವಧಿ ಒಳಗೆ, ಸಂವಿಧಾನದ ಸರಿ ಇರುವ ಪುಸ್ತಕಕ್ಕೆ ಬದಲಾಯಿಸಿಕೊಳ್ಳಬೇಕು. ಆ ಬಳಿಕ ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯನ್ನು ಬದಲಾಯಿಸಲಾಗುವುದಿಲ್ಲ. ಯಾವುದೇ ಹೆಚ್ಚು ಸಮಯವನ್ನೂ ಕೊಡಲಾಗುವುದಿಲ್ಲ.
- ಪ್ರತಿಯೊಂದು ಪ್ರಶ್ನೆಗೆ (A), (B), (C) ಮತ್ತು (D) ಎಂದು ಗುರುತಿಸಿದ ನಾಲ್ಕು ಪರ್ಯಾಯ ಉತ್ತರಗಳಿವೆ. ನೀವು ಪ್ರಶ್ನೆಯ ಎದುರು ಸರಿಯಾದ ಉತ್ತರದ ಮೇಲೆ, ಕೆಳಗೆ ಕಾಣಿಸಿದಂತೆ ಅಂಡಾಕೃತಿಯನ್ನು ಕಪ್ಪಾಗಿಸಬೇಕು.  
ಉದಾಹರಣೆ: 

A	B	●	D
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(C) ಸರಿಯಾದ ಉತ್ತರವಾಗಿದ್ದಾಗ.
- ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಗಳನ್ನು, ಪತ್ರಿಕೆ III ಪುಸ್ತಕಿಯೊಳಗೆ ಕೊಟ್ಟಿರುವ OMR ಉತ್ತರ ಹಾಳೆಯಲ್ಲಿ ಮಾತ್ರವೇ ಸೂಚಿಸತಕ್ಕದ್ದು. OMR ಉತ್ತರ ಹಾಳೆಯಲ್ಲಿನ ಅಂಡಾಕೃತಿ ಹೊರತುಪಡಿಸಿ ಬೇರೆ ಯಾವುದೇ ಸ್ಥಳದಲ್ಲಿ ಗುರುತಿಸಿದರೆ, ಅದರ ಮೌಲ್ಯಮಾಪನ ಮಾಡಲಾಗುವುದಿಲ್ಲ.
- OMR ಉತ್ತರ ಹಾಳೆಯಲ್ಲಿ ಕೊಟ್ಟ ಸೂಚನೆಗಳನ್ನು ಜಾಗರೂಕತೆಯಿಂದ ಓದಿ.
- ಎಲ್ಲಾ ಕೆಲಸವನ್ನು ಪುಸ್ತಕಿಯ ಕೊನೆಯಲ್ಲಿ ಮಾಡತಕ್ಕದ್ದು.
- ನಿಮ್ಮ ಗುರುತನ್ನು ಬಹಿರಂಗಪಡಿಸಬಹುದಾದ ನಿಮ್ಮ ಹೆಸರು ಅಥವಾ ಯಾವುದೇ ಚಿಹ್ನೆಯನ್ನು, ಸಂಗತವಾದ ಸ್ಥಳ ಹೊರತು ಪಡಿಸಿ, OMR ಉತ್ತರ ಹಾಳೆಯ ಯಾವುದೇ ಭಾಗದಲ್ಲಿ ಬರದರೆ, ನೀವು ಅನರ್ಹತೆಗೆ ಬಾಧ್ಯರಾಗಿರುತ್ತೀರಿ.
- ಪರೀಕ್ಷೆಯು ಮುಗಿದನಂತರ, ಕಡ್ಡಾಯವಾಗಿ OMR ಉತ್ತರ ಹಾಳೆಯನ್ನು ಸಂವಿಧಾನದಂತೆ ನೀವು ಹಿಂತಿರುಗಿಸಬೇಕು ಮತ್ತು ಪರೀಕ್ಷಾ ಕೊಠಡಿಯ ಹೊರಗೆ OMR ನ್ನು ನಿಮ್ಮೊಂದಿಗೆ ಕೊಂಡೊಯ್ಯ ಕೊಡದು.
- ಪರೀಕ್ಷೆಯ ನಂತರ, ಪರೀಕ್ಷಾ ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯನ್ನು ಮತ್ತು ನಕಲು OMR ಉತ್ತರ ಹಾಳೆಯನ್ನು ನಿಮ್ಮೊಂದಿಗೆ ತೆಗೆದುಕೊಂಡು ಹೋಗಬಹುದು.
- ನೀಲಿ/ಕಪ್ಪು ಬಾಲ್ ಪಾಯಿಂಟ್ ಪೆನ್ ಮಾತ್ರವೇ ಉಪಯೋಗಿಸಿ.
- ಕ್ಯಾಲ್ಕುಲೇಟರ್ ಅಥವಾ ಲಾಗ್ ಟೇಬಲ್ ಇತ್ಯಾದಿಯ ಉಪಯೋಗವನ್ನು ನಿಷೇಧಿಸಲಾಗಿದೆ.
- ಸರಿ ಅಲ್ಲದ ಉತ್ತರಗಳಿಗೆ ಋಣ ಅಂಕ ಇರುವುದಿಲ್ಲ.

Instructions for the Candidates

- Write your roll number in the space provided on the top of this page.
- This paper consists of seventy five multiple-choice type of questions.
- 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 this cover page. Do not accept a booklet without sticker-seal and do not accept an 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.
- Each item has four alternative responses marked (A), (B), (C) and (D). You have to darken the oval as indicated below on the correct response against each item.  
Example : 

A	B	●	D
---	---	---	---

  
where (C) is the correct response.
- Your responses to the question of Paper III are to be indicated in the OMR Sheet kept inside the Booklet. If you mark at any place other than in the ovals in OMR Answer Sheet, it will not be evaluated.
- Read the instructions given in OMR carefully.
- Rough Work is to be done in the end of this booklet.
- 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.
- 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.
- You can take away question booklet and carbon copy of OMR Answer Sheet soon after the examination.
- Use only Blue/Black Ball point pen.
- Use of any calculator or log table etc., is prohibited.
- There is no negative marks for incorrect answers.

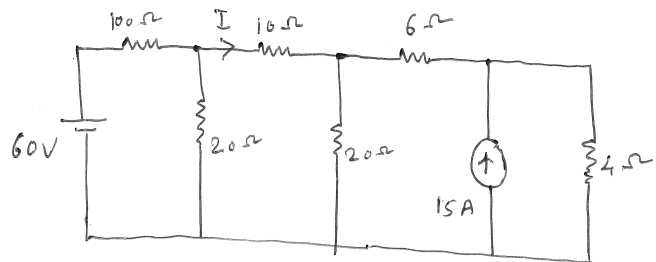


**ELECTRONIC SCIENCE**  
**Paper – III**

**Note :** This paper contains **seventy-five (75)** objective type questions. **Each** question carries **two (2)** marks. **All** questions are **compulsory**.

1. What does a high resistance reading in both forward and reverse bias directions indicate ?  
(A) A good diode  
(B) An open diode  
(C) A shorted diode  
(D) A defective ohmmeter
  
2. Electron mobility and life time in a semiconductor at room temperature are  $0.36 \text{ m}^2/(\text{Vs})$  and  $340 \mu\text{s}$ . The diffusion length is  
(A) 3.13 mm  
(B) 1.77 mm  
(C) 3.55 mm  
(D) 3.13 cm
  
3. For BJT, early voltage  $V_A$  is 100V. In common emitter configuration, quiescent  $V_{CE}$  is 10V. What percentage change in quiescent  $I_C$  would occur, if early voltage is made  $\infty$  ?  
(A) 10%  
(B) 20%  
(C) 5%  
(D) 0%

4. A network function has zeros only in the left half of the S-plane, then it is said to be  
(A) a stable function  
(B) a non-minimum phase function  
(C) a minimum phase function  
(D) an all pass function
  
5. Consider the following circuit



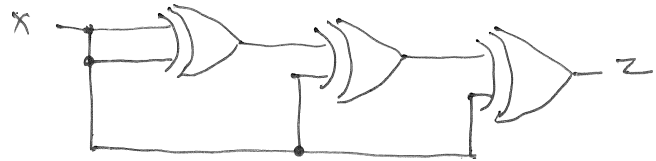
What is the current  $I$  in the above circuit ?

- (A) 0A  
(B) 2A  
(C) 5A  
(D) 6A
  
6. A reciprocal network is described by  
$$Z_{21} = \frac{S^2}{3S^2 + 2} \text{ and } Z_{22} = \frac{S^2 + 4S}{3S^2 + 2}.$$
Its transmission zeros are located at  
(A)  $S = 0$   
(B)  $S = \pm j2$   
(C)  $S = 0$  and at  $S = \pm j2$   
(D)  $S = 0$  and at  $S = \infty$



7. The percentage voltage regulation of voltage supply providing 100V unloaded and 95 at full load is
- (A) 5.0%  
(B) 0.53%  
(C) 5.3%  
(D) 50%
8. What starts a free running multivibrator ?
- (A) a trigger  
(B) an input signal  
(C) an external circuit  
(D) nothing
9. An IC operational amplifier has a typical open loop gain of 1200 and the common mode rejection of 55 dB. What is the Common Mode Rejection Ratio (CMRR) ?
- (A) 550  
(B) 560  
(C) 570  
(D) 580
10. Assuming that only X and Y logic inputs are available and their complements  $\bar{X}$  and  $\bar{Y}$  are not available, what is the minimum number of two input NAND gates require to implement  $X \oplus Y$  ?
- (A) 2  
(B) 3  
(C) 4  
(D) 5

11. Output of the following circuit is



- (A) 0  
(B) 1  
(C) X  
(D)  $\bar{X}$
12. A ring counter closely resembles
- (A) up-down counter  
(B) parallel-counter  
(C) shift register  
(D) ripple carry counter
13. In 8086, if the content of the code segment register is 1FAB and the contents of the IP register is 10AI, then the effective memory address is
- (A) 1FBC0  
(B) 304C  
(C) FDB5  
(D) 20B51



14. Consider the following instructions

executed in 8086

PUSH AX ; AX has 20 H in it

PUSH BX ; BX has 34 in it

POP AX ;

ADD AX, BX ;

POP G ;

The value stored in G would be

(A) 20 H

(B) 34 H

(C) 54 H

(D) 68 H

15. Consider the following

1) Sign flag

2) Zero flag

3) Carry flag

4) Parity flag

Which of the above flags of 8085 gets affected by execution of the instruction SUB B ?

(A) 1 and 2

(B) 1 and 3

(C) 3 and 4

(D) 1, 2, 3 and 4

16. Which of the following is not a valid mathematical function in 'C' ?

(A) frexp (X) ;

(B) atan2 (X, Y) ;

(C) srand (X) ;

(D) fmod (X) ;

17. Comment on the output of following C program.

```
#include <stdio.h>
```

```
main( )
```

```
{
```

```
    int a = 1;
```

```
    printf("size of a is %d,", sizeof(++a));
```

```
    printf ("value of a is %d", a);
```

```
};
```

(A) Size of a is 4, value of a is 1

(B) Size of a is 4, value of a is 2

(C) Size of a is 2, value of a is 2

(D) Size of a is 2, value of a is 4

18. Predict the data type of the following mathematical operation in 'C' language.

$2 * 9 + 3/2.0$

(A) int

(B) long

(C) float

(D) double



19. In Gunn oscillator where the diode is operated in a tunable resonant circuit, most of the sample length of the Gunn device is maintained in the negative conductance state during most of the R.F. cycle for
- (A) delayed domain mode
  - (B) quenched domain mode
  - (C) LSA mode
  - (D) hybrid mode
20. In a rectangular waveguide with broader dimension  $a$  and narrow dimension  $b$ , the dominant mode of microwave propagation would be
- (A)  $TE_{10}$
  - (B)  $TM_{10}$
  - (C)  $TE_{01}$
  - (D)  $TM_{01}$
21. In a reflex Klystron, the velocity modulation
- (A) occurs near the reflector
  - (B) occurs in the resonator gap
  - (C) occurs near the accelerating grid
  - (D) does not occur at all
22. Capture effect is the characteristics of
- (A) AM
  - (B) FM
  - (C) PCM
  - (D) FDM
23. The bandwidth of a 'N' bit binary coded PCM signal for modulating a signal having bandwidth of 'f' Hz is
- (A)  $\frac{f}{N}$  Hz
  - (B)  $\frac{f}{N^2}$  Hz
  - (C)  $Nf$  Hz
  - (D)  $N^2f$  Hz
24. In a PCM system each quantization level is encoded into 8 bits. The signal to quantization noise ratio is equal to
- (A)  $\frac{1}{12} \times \left( \frac{1}{256} \right)^2$
  - (B) 48 dB
  - (C) 64 dB
  - (D) 256 dB
25. One of the following devices can be used as a relaxation oscillator
- (A) SCR
  - (B) TRIAC
  - (C) BJT
  - (D) UJT



26. In an SCR circuit, the anode is grounded. The voltages at the gate and cathode at a particular working condition are measured to be  $-50\text{V}$  and  $-55\text{V}$ , respectively. Based on this observation, it could be inferred that
- (A) The SCR is in forward blocking mode
  - (B) The SCR is in conducting mode
  - (C) The SCR is in reverse blocking mode
  - (D) The SCR is damaged
27. In optical fiber communication systems, FBG is used for
- (A) Fiber optic local area network
  - (B) Non-linearity management
  - (C) Source
  - (D) Dispersion compensation
28. In wire wound strain gauges, the change in resistance is due to
- (A) Change in diameter of the wire
  - (B) Change in length of the wire
  - (C) Change in both length and diameter
  - (D) Change in resistivity
29. A set of independent measurements of current was taken by six observers and recorded as  $12.8\text{ mA}$ ,  $12.2\text{ mA}$ ,  $12.5\text{ mA}$ ,  $13.1\text{ mA}$ ,  $12.9\text{ mA}$  and  $12.4\text{ mA}$ . The arithmetic mean of the measurement is
- (A)  $12.85\text{ mA}$
  - (B)  $12.65\text{ mA}$
  - (C)  $12.75\text{ mA}$
  - (D)  $12.80\text{ mA}$
30. In a control system integral error compensation \_\_\_\_\_ steady state error.
- (A) increases
  - (B) minimizes
  - (C) does not have any effect on
  - (D) saturates
31. Which of the following is/are valid statement(s) ?
- I) Carbon is used as it does not belong to IV group of periodic table.
  - II) GaAs is used as semiconductor and does not belong to IV group of periodic table.
  - III) Si is used as widely used semiconductor as it is cheaper than Ge.
  - IV) Ge is still used in low voltage devices.
- (A) II, IV
  - (B) I, II, III, IV
  - (C) II, III
  - (D) II, III, IV



32. Which of the following is/are valid statements ?

- I) Max power transfer theorem yields voltage equivalent circuit.
- II) Thevenin's theorem yield voltage equivalent circuit.
- III) Super position theorem gives current equivalent circuit.
- IV) Norton's theorem yield current equivalent circuit.

- (A) I, III
- (B) II, IV
- (C) I, II, IV
- (D) II, III, IV

33. Identify the following configurations with voltage gain.

- I) Common emitter
- II) Common base
- III) Common collector
- IV) Emitter follower

- (A) I, IV
- (B) I, II
- (C) II, III
- (D) I, II, IV

34. Which of the following is/are valid statement(s) ?

- I) JK flip-flop is an example of a synchronous sequential circuit.
- II) Decoder requires clock for its operation.
- III) NAND gate can be used as universal gate.
- IV) Multiplexer can be used as universal gate.

- (A) III
- (B) II, III
- (C) III, IV
- (D) III, I

35. Which of the following is/are valid statement(s) ?

- I) 8086 has direction flag
- II) 8255 can be used as a counter
- III) 8086 has FIFO queue
- IV) 8086 has built in counter

- (A) I, IV
- (B) III
- (C) I, III
- (D) II, III



36. Which of the following is/are valid statement(s) ?
- I) Dohwhile statement is a entry-controlled loop statement.
  - II) While (1) implies a finite loop.
  - III) External variables are alive and active in the entire program.
  - IV) Compound relational expression are used to test more than one condition in logical expression with operators.
- (A) III, IV  
(B) II, III, IV  
(C) I, III, IV  
(D) I
37. Which of the following is/are valid statement(s) ?
- I) Gunn diode is not a TED.
  - II) Gunn diode is bulk semiconductor device.
  - III) Gunn diode exhibits negative resistance under certain conditions.
  - IV) Gunn diode is used for rectification.
- (A) II, III  
(B) I, II  
(C) I, II, III  
(D) III

38. Which of the following is/are valid statement(s) ?
- I) Shot noise is found in transistor device.
  - II) Noise can be completely removed by local oscillator.
  - III) Johnson noise is due to load resistance.
  - IV) Super heterodyne operation increases the signal to noise ratio.
- (A) II (B) I, III, IV  
(C) II, III (D) I, IV
39. Which of the following is/are valid statement(s) ?
- I) LED is a stimulated emission device.
  - II) P-I-N diode is a spontaneous emission device.
  - III) Single mode fiber is best suited for long distance communication.
  - IV) Silica fiber with  $1.55\mu\text{m}$  wavelength operation has lowest loss.
- (A) III (B) I, II, III, IV  
(C) II, III (D) III, IV
40. Which of the following is/are valid statement(s) ?
- I) Proportional derivative controller are used for fast response system.
  - II) Proportional derivative controller has to be used with proportional controller.
  - III) On-off controller are best suited for accurate temperature controller system.
  - IV) Kitchen refrigerators use PID controllers.
- (A) II, III, IV  
(B) II  
(C) I, II  
(D) I, III



**Q No. 41 to 50 :**

Assertion – Reason type questions :

The following items consists of two statements, one labelled the 'Assertion (A)' and the other labelled the 'Reason (R)'. You are to examine these two statements 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 answers to these items using the codes given below and mark your answer sheet 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 and (R) is false.
- (D) (A) is false and (R) is true.

**41. Assertion (A) :** In a semiconductor at high temperature the avalanche breakdown voltage is higher.

**Reason (R) :** At high temperature mean free path of electrons and holes are shorter therefore a larger field is required to cause ionisation.

**42. Assertion (A) :** Laplace transformation is a transformation of time domain to a frequency domain for continuous time signals.

**Reason (R) :** Z-transformation is a transformation of time domain to a frequency domain for discrete time signals.

**43. Assertion (A) :** Virtual ground exists only for Op-Amps with infinite open loop gain.

**Reason (R) :** Virtual ground is a ground for voltage but not for the current.

**44. Assertion (A) :** CMOS logic families consumes least power amongst all logic families.

**Reason (R) :** Construction of CMOS it self permits power consumption only during transition.

**45. Assertion (A) :** 8085 can handle 16 bit data.

**Reason (R) :** 8085 has 16-bit AZU.

**46. Assertion (A) :** Branch instructions are most powerful instructions as they allow the microprocessor to change sequence of program.

**Reason (R) :** Interrupts also change the sequence of program. Interrupts are also branching statements.

**47. Assertion (A) :** In a microwave communication links, rain causes fading and this is a great concern in communication systems.

**Reason (R) :** Water droplets in the path of an electromagnetic wave will scatter the energy in the waves and this collective scattering will weaken the incident wave in the forward direction.

**48. Assertion (A) :** In PCM, the dynamic signal range and the quantisation noise are always design trade offs.

**Reason (R) :** In PCM system, reduction in step size leads to increase in the quantisation noise.

**49. Assertion (A) :** LCD is a high speed display device.

**Reason (R) :** LCD consumes low power.

**50. Assertion (A) :** Spectro photometers are used for microwave frequency analysis.

**Reason (R) :** Spectro photometers use monochromators.

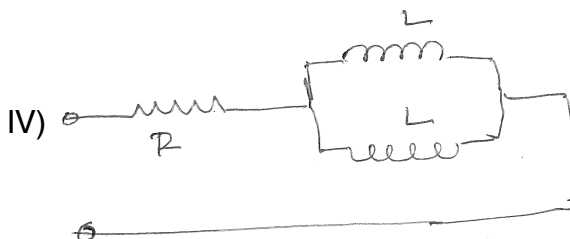
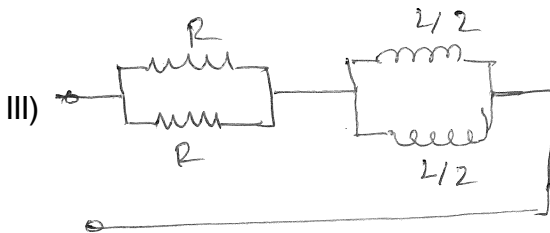
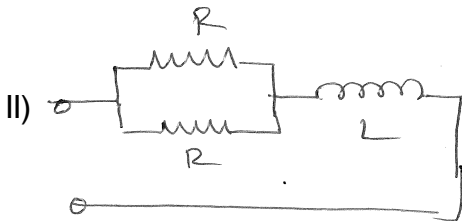
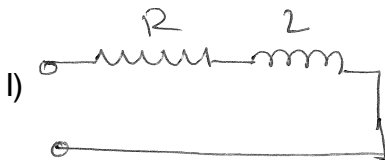


51. Following are the steps involved in IC fabrication.

- I) Crystal growth
- II) Epitaxial growth
- III) Photo etching
- IV) Diffusion

- (A) IV, III, II, I                      (B) I, III, II, IV
- (C) I, II, III, IV                      (D) I, II, IV, III

52. The correct sequence of the time constants of the circuits shown below in the increasing order is



- (A) I, II, III, IV                      (B) IV, II, I, III
- (C) IV, III, I, II                      (D) III, IV, II, I

53. The input resistance of a common emitter stage can be increased by

- I) Unbypassing emitter resistance
- II) Boot Strapping
- III) Biasing it at low quiescent current
- IV) Using compounded BJTs

The correct sequence in descending order of the effectiveness of these methods is

- (A) I, IV, II, III                      (B) II, IV, I, III
- (C) IV, II, I, III                      (D) IV, III, I, II

54. Arrange the following logic families in the increasing order of propagation delay.

- I) CMOS                      II) TTL
- III) ECL                      IV) DTL

- (A) I, IV, II, III                      (B) IV, III, II, I
- (C) IV, I, II, III                      (D) I, II, IV, III

55. Following are the instructions of 8085 microprocessor.

- I) MVI A, 00H
- II) CALL
- III) HLT
- IV) LXI H, FFFF

Arrange them increasing order of time consumption :

- (A) I, II, III, IV                      (B) I, IV, II, III
- (C) III, I, IV, II                      (D) III, I, II, IV

56. Arrange the following in the increasing order of number of capacitor elements.

- I) Phase shift oscillator
- II) Astable multivibrator
- III) Bistable multivibrator
- IV) Monoshot multivibrator

- (A) I, II, III, IV                      (B) III, IV, II, I
- (C) III, II, I, IV                      (D) III, I, IV, II

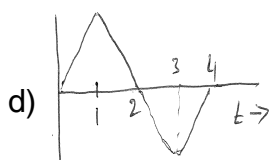
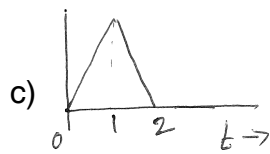
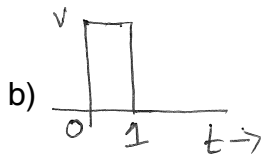
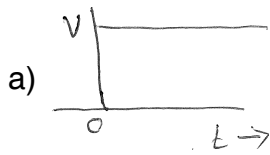


57. Following are the microwave components in receiver system.
- I) Parabolic Antenna
  - II) Receiver
  - III) Low noise block converter
  - IV) Feed horn
- (A) IV, I, III, II                      (B) I, II, III, IV  
(C) I, III, IV, II                      (D) I, IV, III, II
58. The following are the 4 different blocks used in super heterodyne receiver.
- I) Mixer
  - II) I. F. Amplifier
  - III) Envelop detector
  - IV) RF stage
- (A) IV, III, II, I                      (B) IV, I, II, III  
(C) IV, II, III, I                      (D) I, IV, II, III
59. Following are the four detectors :
- I) Photo transistors
  - II) Avalanche photodiode
  - III) LDR
  - IV) PN diode
- Arrange them in the increasing order of response speed.
- (A) III, I, IV, II                      (B) III, II, IV, I  
(C) III, IV, II, I                      (D) I, III, IV, II
60. Following are the transducers :
- I) Thermistor
  - II) RTD
  - III) Semiconductor strain gauze
  - IV) Potentiometer
- Arrange them in the increasing order of linearity :
- (A) I, II, III, IV                      (B) I, IV, II, III  
(C) I, III, II, IV                      (D) III, IV, II, I

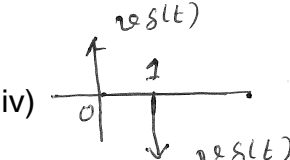
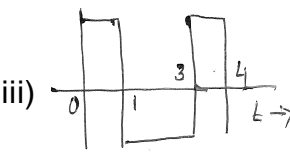
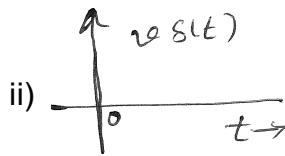
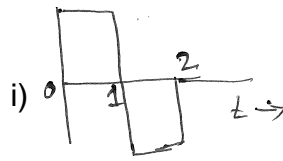
61. **List – I**
- a) BJT
  - b) FET
  - c) Zener diode
  - d) Tunnel diode
- List – II**
- i) Pinch off effect
  - ii) Avalanche breakdown
  - iii) Negative resistance characteristics
  - iv) Punch through effect
- Codes :**
- |     | a  | b   | c   | d   |
|-----|----|-----|-----|-----|
| (A) | iv | i   | ii  | iii |
| (B) | iv | ii  | iii | i   |
| (C) | iv | iii | ii  | i   |
| (D) | i  | ii  | iii | iv  |
62. **List – I**
- a) Norton's theorem
  - b) Super position theorem
  - c) Thevenin's theorem
  - d) Kirchoff's current law
- List – II**
- i) Effects of independent source in a linear circuit are additive
  - ii) law of non-accumulation of charge holds good
  - iii) Current source with shunt resistance
  - iv) Voltage source with series resistance
- Codes :**
- |     | a   | b  | c   | d  |
|-----|-----|----|-----|----|
| (A) | iii | i  | iv  | ii |
| (B) | iii | ii | iv  | i  |
| (C) | iii | iv | ii  | i  |
| (D) | i   | ii | iii | iv |



63. List – I



List – II



Match the above for differentiator circuit :

Codes :

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

64. List – I

- |                     |                         |
|---------------------|-------------------------|
| a) Shift register   | i) Clock generator      |
| b) Four bit counter | ii) Divide by n counter |
| c) Ring counter     | iii) Stepper motor      |
| d) Multivibrator    | iv) Decimal counter     |

Match the device in List – I to applications in List – II.

Codes :

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

65. List – I

- |                  |                                   |
|------------------|-----------------------------------|
| a) Register B    | i) Memory pointer                 |
| b) Register HL   | ii) General purpose register      |
| c) Register PC   | iii) Next memory location pointer |
| d) Stack pointer | iv) LIFO memory point             |

Match the above list with regard to 8085 :

Codes :

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

66. List – I

- |  |   |
|--|---|
| a) rand () /<br>RAND_max ;   | i) illegal<br>declaration                   |
| b) int long y : 33 ;   | ii) pointer to an<br>array                  |
| c) int (*a) [7] ;  | iii) random number<br>generation            |
| d) ungetc (c, f <sub>p</sub> ) ;<br>// where<br>declarations are<br>int c and<br>FILE*f <sub>p</sub> | iv) returning either<br>character<br>or EOF |

In context with 'C' language match the statements in List – I with their intended functionality in List – II.

Codes :

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



- 67. List – I**
- a) PIN diode
  - b) GaAs MOSFET
  - c) Klustron
  - d) Varactor diode
- List – II**
- i) Microwave amplification
  - ii) Microwave tuning
  - iii) Microwave switching
  - iv) Microwave source

**Codes :**

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

- 68. List – I**
- a) Compounding
  - b) Aliasing
  - c) Pre-emphasis
  - d) Down conversion
- List – II**
- i) Super heterodyne receiver
  - ii) Boosting of higher frequency components
  - iii) Overlapping of slide bands
  - iv) Non-uniform quantisation

**Codes :**

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

- 69. List – I**
- a) DC to DC
  - b) DC to AC
  - c) AC to DC
  - d) AC to AC
- List – II**
- i) Rectifier
  - ii) Cycloconverter
  - iii) Chopper
  - iv) Inverter

**Codes :**

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

- 70. List – I**
- a) LVDT
  - b) Thermopile
  - c) Bourdon tube
  - d) Moving coil type
- List – II**
- i) Velocity
  - ii) Pressure
  - iii) Linear displacement
  - iv) Radiation

**Codes :**

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



Transmission line is a medium through which electromagnetic energy is transmitted from one place to another with minimum loss. A transmission line is a distributed parameter circuit having resistance per unit length, inductance per unit length, conductance per unit length and capacitance per unit length. In a transmission line the velocity of propagation depends merely on the inductance per unit length and capacitance per unit length. The transmission line can be analysed by the method of distributed circuit theory. Here the analysis involves only one space co-ordinate in addition to the time variable. The transmission line equations are similar to Helmholtz equation and provide two travelling waves propagating in opposite directions. These two travelling waves will generate a standing wave inside the transmission line. From the amplitude of these two travelling waves one can calculate the reflection coefficient and voltage standing wave ratio. In a loss less transmission line one can neglect the series resistance per unit length and shunt conductance per unit length. The important parameter of a transmission line is its characteristic impedance  $Z_0$ . It is independent of the length of the transmission line and depends only on the distributed parameters. If a transmission line is terminated on a load impedance  $Z_L$  the input impedance can be calculated. The input impedance of a loss less transmission line is

$$Z_{in} = Z_0 \left[ \frac{Z_L \cos \beta l + j Z_0 \sin \beta l}{Z_0 \cos \beta l + j Z_L \sin \beta l} \right]$$

71. When an electromagnetic wave propagates through a open circuited transmission line when it reaches the open circuit end then,
- (A) Voltage at the open end is zero
  - (B) Voltage at the open end is maximum
  - (C) Current at the open end is maximum
  - (D) Both voltage and current are zero
72. The input impedance of a  $\lambda/4$  short circuited transmission line of characteristic impedance  $100 \Omega$  is
- (A)  $100 \Omega$
  - (B)  $50 \Omega$
  - (C)  $\infty$
  - (D) Zero
73. The voltage reflection coefficient of a transmission line terminated with the characteristic impedance is
- (A)  $\infty$
  - (B) 1
  - (C) Zero
  - (D) Between 1 and  $\infty$
74. The primary constants of a transmission line are
- (A) R and L
  - (B) R and C
  - (C) R, L and C
  - (D) R, L, C and G
75. In a loss less transmission line one can neglect
- (A) Series inductance and shunt capacitance
  - (B) Series resistance and shunt conductance
  - (C) Series resistance and inductance
  - (D) Series resistance and shunt conductance



Total Number of Pages : 16

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