Test Paper : **II**	Test Booklet Serial No. : _____
Test Subject : **ELECTRONIC SCIENCE**	OMR Sheet No. : _____
Test Subject Code : **K-3117**	Roll No.
	(Figures as per admission card)

Name & Signature of Invigilator/s

Signature : _____

Name : _____

Paper : **II**
Subject : **ELECTRONIC SCIENCE**

Time : 1 Hour 15 Minutes   Maximum Marks : 100

Number of Pages in this Booklet : **8**   Number of Questions in this Booklet : **50**

ಅಭ್ಯರ್ಥಿಗಳಿಗೆ ಸೂಚನೆಗಳು	Instructions for the Candidates
1. ಈ ಪುಟದ ಮೇಲ್ತುದಿಯಲ್ಲಿ ಒದಗಿಸಿದ ಸ್ಥಳದಲ್ಲಿ ನಿಮ್ಮ ರೋಲ್ ನಂಬರನ್ನು ಬರೆಯಿರಿ.	1. Write your roll number in the space provided on the top of this page.
2. ಈ ಪತ್ರಿಕೆಯು ಬಹು ಆಯ್ಕೆ ವಿಧದ ಐವತ್ತು ಪ್ರಶ್ನೆಗಳನ್ನು ಒಳಗೊಂಡಿದೆ.	2. This paper consists of fifty multiple-choice type of questions.
3. ಪರೀಕ್ಷೆಯ ಪ್ರಾರಂಭದಲ್ಲಿ, ಪ್ರಶ್ನೆಪುಸ್ತಿಕೆಯನ್ನು ನಿಮಗೆ ನೀಡಲಾಗುವುದು. ಮೊದಲ 5 ನಿಮಿಷಗಳಲ್ಲಿ ನೀವು ಪುಸ್ತಿಕೆಯನ್ನು ತೆರೆಯಲು ಮತ್ತು ಕೆಳಗಿನಂತೆ ಕಡ್ಡಾಯವಾಗಿ ಪರೀಕ್ಷಿಸಲು ಕೋರಲಾಗಿದೆ.	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) ಪ್ರಶ್ನೆ ಪುಸ್ತಿಕೆಗೆ ಪ್ರವೇಶಾವಕಾಶ ಪಡೆಯಲು, ಈ ಹೊದಿಕೆ ಪುಟದ ಅಂಚಿನ ಮೇಲಿರುವ ಪೇಪರ್ ಸೀಲನ್ನು ಹರಿಯಿರಿ. ಸ್ಟಿಕ್ಕರ್ ಸೀಲ್ ಇಲ್ಲದ ಅಥವಾ ತೆರೆದ ಪುಸ್ತಿಕೆಯನ್ನು ಸ್ವೀಕರಿಸಬೇಡಿ.	(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) 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 ಕೂಡಲೇ 5 ನಿಮಿಷದ ಅವಧಿ ಒಳಗೆ, ಸಂವೀಕ್ಷಕರಿಂದ ಸರಿ ಇರುವ ಪುಸ್ತಿಕೆಗೆ ಬದಲಾಯಿಸಿಕೊಳ್ಳಬೇಕು. ಆ ಬಳಿಕ ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯನ್ನು ಬದಲಾಯಿಸಲಾಗುವುದಿಲ್ಲ, ಯಾವುದೇ ಹೆಚ್ಚು ಸಮಯವನ್ನೂ ಕೊಡುವುದಿಲ್ಲ.	(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. 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.	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. ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆ I ರಲ್ಲಿ ಕೊಟ್ಟಿರುವ **OMR** ಉತ್ತರ ಹಾಳೆಯಲ್ಲಿ, ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆ I ಮತ್ತು ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆ II ರಲ್ಲಿ ಇರುವ ಪ್ರಶ್ನೆಗಳಿಗೆ ನಿಮ್ಮ ಉತ್ತರಗಳನ್ನು ಸೂಚಿಸತಕ್ಕದ್ದು. OMR ಹಾಳೆಯಲ್ಲಿ ಅಂಡಾಕೃತಿಯಲ್ಲದ ಬೇರೆ ಯಾವುದೇ ಸ್ಥಳದಲ್ಲಿ ಉತ್ತರವನ್ನು ಗುರುತಿಸಿದರೆ, ಅದರ ಮೌಲ್ಯಮಾಪನ ಮಾಡಲಾಗುವುದಿಲ್ಲ.	5. Your responses to the questions are to be indicated in the **OMR Sheet kept inside the Paper I Booklet only**. If you mark at any place other than in the circles in the OMR Sheet, it will not be evaluated.
6. OMR ಉತ್ತರ ಹಾಳೆಯಲ್ಲಿ ಕೊಟ್ಟ ಸೂಚನೆಗಳನ್ನು ಜಾಗರೂಕತೆಯಿಂದ ಓದಿರಿ.	6. Read the instructions given in OMR carefully.
7. ಎಲ್ಲಾ ಕರಡು ಕೆಲಸವನ್ನು ಪುಸ್ತಿಕೆಯ ಕೊನೆಯಲ್ಲಿ ಮಾಡತಕ್ಕದ್ದು.	7. Rough Work is to be done in the end of this booklet.
8. ನಿಮ್ಮ ಗುರುತನ್ನು ಬಹಿರಂಗಪಡಿಸಬಹುದಾದ ನಿಮ್ಮ ಹೆಸರು ಅಥವಾ ಯಾವುದೇ ಚಿಹ್ನೆಯನ್ನು, ಸಂಗತವಾದ ಸ್ಥಳ ಹೊರತು ಪಡಿಸಿ, OMR ಉತ್ತರ ಹಾಳೆಯ ಯಾವುದೇ ಭಾಗದಲ್ಲಿ ಬರೆದರೆ, ನೀವು ಅನರ್ಹತೆಗೆ ಬಾಧ್ಯರಾಗಿರುತ್ತೀರಿ.	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. ಪರೀಕ್ಷೆಯು ಮುಗಿದನಂತರ, ಕಡ್ಡಾಯವಾಗಿ OMR ಉತ್ತರ ಹಾಳೆಯನ್ನು ಸಂವೀಕ್ಷಕರಿಗೆ ನೀವು ಹಿಂತಿರುಗಬೇಕು ಮತ್ತು ಪರೀಕ್ಷಾ ಕೊಠಡಿಯ ಹೊರಗೆ OMR ನ್ನು ನಿಮ್ಮೊಡನೆ ಕೊಂಡೊಯ್ಯಕೂಡದು.	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. ಪರೀಕ್ಷೆಯ ನಂತರ, ಪರೀಕ್ಷಾ ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯನ್ನು ಮತ್ತು ನಕಲು OMR ಉತ್ತರ ಹಾಳೆಯನ್ನು ನಿಮ್ಮೊಂದಿಗೆ ತೆಗೆದುಕೊಂಡು ಹೋಗಬಹುದು.	10. You can take away question booklet and carbon copy of OMR Answer Sheet after the examination.
11. ನೀಲಿ/ಕಪ್ಪು ಬಾಲ್‌ಪಾಯಿಂಟ್ ಪೆನ್ ಮಾತ್ರವೇ ಉಪಯೋಗಿಸಿರಿ.	11. **Use only Blue/Black Ball point pen.**
12. ಕ್ಯಾಲ್ಕುಲೇಟರ್, ವಿದ್ಯುನ್ಮಾನ ಉಪಕರಣ ಅಥವಾ ಲಾಗ್ ಟೇಬಲ್ ಇತ್ಯಾದಿಯ ಉಪಯೋಗವನ್ನು ನಿಷೇಧಿಸಲಾಗಿದೆ.	12. **Use of any calculator, Electronic gadgets or log table etc., is prohibited.**
13. ಸರಿ ಅಲ್ಲದ ಉತ್ತರಗಳಿಗೆ ಋಣ ಅಂಕ ಇರುವುದಿಲ್ಲ.	13. There is no negative marks for incorrect answers.
14. ಕನ್ನಡ ಮತ್ತು ಇಂಗ್ಲೀಷ್ ಆವೃತ್ತಿಗಳ ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಗಳಲ್ಲಿ ಯಾವುದೇ ರೀತಿಯ ವ್ಯತ್ಯಾಸಗಳು ಕಂಡುಬಂದಲ್ಲಿ, ಇಂಗ್ಲೀಷ್ ಆವೃತ್ತಿಯಲ್ಲಿರುವುದೇ ಅಂತಿಮವೆಂದು ಪರಿಗಣಿಸಬೇಕು.	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.**

K-3117   ①   ಪು.ತಿ.ನೋ./P.T.O.

ELECTRONIC SCIENCE
Paper – II

Note : This paper contains **fifty (50)** objective type questions. **Each** question carries **two (2)** marks. **All** questions are **compulsory**.

1. In intrinsic semiconductor at absolute zero temperature the probability of finding an electron in the conduction band is
   (A) 0%   (B) 40%
   (C) 80%   (D) 100%

2. The diffusion capacitance of a P-N junction
   (A) Decreases with increasing current and increasing temperature
   (B) Decreases with decreasing current and increasing temperature
   (C) Increases with increasing current and increasing temperature
   (D) Increases with increasing current and decreasing temperature

3. In a balanced Wheatstone bridge, if position of defector and source are interchanged then bridge will still remain balanced
   (A) Duality principle
   (B) Compensation theorem
   (C) Reciprocity principle
   (D) Equivalence theorem

4. Laplace transform of x(at)

   (A) $|a| \times (as)$ (B) $\frac{1}{|a|} \times (as)$

   (C) $\frac{1}{|a|} \times \left(\frac{s}{a}\right)$ (D) $\frac{1}{|a|} \times (s)$

5. Which of the following offers poor stability against variations in the leakage current ?
   (A) Fixed-bias configuration
   (B) Emitter-bias configuration
   (C) Voltage-divider bias configuration
   (D) Collector to base bias configuration

6. A triangular wave oscillator can consist of an op-amp comparator, followed by a(n)
   (A) Differentiator (B) Amplifier
   (C) Multivibrator   (D) Integrator

7. One of the following is not a synchronous input with reference to the output of flip-flops
   (A) J-input in J-K flip-flop
   (B) R-input in an R-S flip-flop
   (C) PRESET input in a J-K flip-flop
   (D) D-input in a D-flip-flop

8. Determine the output frequency for a frequency division circuit that contains 12 flip-flops with an input clock frequency of 20.48 MHz
   (A) 1.7067 MHz   (B) 5 kHz
   (C) 30.24 kHz   (D) 15 kHz

9. If the following instruction is executed by 8085 microprocessor then the sequence of values written at the address pin A15-A8 is
   8FFE LDA 4567H
   (A) 8F, 90, 45, 67 (B) 8F, 8F, 90, 67
   (C) 8F, 8F, 90, 45 (D) FF, FF, 00, 67

10. A 8085 based microprocessor kit is supposed to do the following :
    i) Acquire two inputs from ADC,
    ii) Add them and display the result on a serial display
    Identify which of the following IC is not required ?
    (A) 8255   (B) 8253
    (C) 8251   (D) 8279

11. Format of double floating point data type is
   (A) Sign bit, 11 bit exponent and 52 bit mantissa
   (B) Sign bit, 8 bit exponent and 23 bit mantissa
   (C) Sign bit, 15 bit exponent and 64 bit mantissa
   (D) 8 bit exponent and 64 bit mantissa

12. Which of the following is type declaration statement in C ?
   (A) s = s +1;
   (B) king = horse +1;
   (C) int bar;
   (D) prin = prin * prin;

13. The wave in wave guide has
   (A) group velocity inversally proportional to wavelength
   (B) larger frequency than in free space
   (C) diminishing wavelength than in the free space
   (D) larger wavelength than in the free space

14. In an impedance Smith chart, a clockwise movement along a constant resistance circle gives rise to
   (A) decrease in the value of reactance
   (B) an increase in the value of reactance
   (C) no change in reactance value
   (D) no change in the impedance value

15. An audio signal (say from 50 Hz to 10000 Hz) is frequency translated by a carrier having a frequency of 106 Hz. The values of initial (without frequency translation) and final (after frequency translation) fractional change in frequency from one band edge to the other are
   (A) 200 and 1.01 (B) 200 and 10.01
   (C) 200 and 100.1 (D) 200 and 200

16. In standard pulse code modulation system
   (A) Suffers from the disadvantages of its incompatibly with TDM
   (B) Quantising noise can be reduced by decreasing the number
   (C) Quantising noise can be overcomed by companding
   (D) Large bandwidth is required

17. An SCR is triggered at 40° in the positive half cycle only. The average anode cuurent is 50 A. If the firing angle is changed to 80°, the average anode current is likely to be
   (A) 50 A
   (B) 25 A
   (C) Less than 50 A but more than 25 A
   (D) Less than 25 A

18. A technique that is used to minimize the intermodal dispersion effect is to
   (A) Minimise the core diameter
   (B) Use a higher frequency light source
   (C) Use plastic cladding
   (D) Use of glass cladding

19. Fourier transform of a signal can be visually displayed on following instrument
   (A) CRO
   (B) Digital storage oscilloscope
   (C) Spectrum analyser
   (D) Logic analyser

20. A lead compensator may be represented by one of the following transfer functions
   (A) $\dfrac{s+2}{s+4}$ (B) $\dfrac{s+4}{s+2}$
   (C) $\dfrac{s(s+2)}{s+4}$ (D) $\dfrac{s+2}{s(s+4)}$

Q. No. (s) 21 to 30 : The following items consist of two statements, one labeled the "Assertion (A)" and other "Reason (R)". You are to examine these two statements carefully and decide if the Assertion (A) and the Reason (R) an 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 :

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

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

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

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

21. **Assertion (A)** : After ion implantation, annealing is necessary.

    Reason (R) : This repairs the crystal damage and activates the dopants.

22. **Assertion (A)** : The piecewise linear equivalent circuit model is the most accurate equivalent model of a diode.

    Reason (R) : The model is not valid for both AC and DC applications.

23. **Assertion (A)** : An Op-Amp can amplify DC signal

    Reason (R) : Op-Amp consists of differential input stage.

24. **Assertion (A)** : In a serial in serial out shift register, access is available only to the left most or right most flip-flops.

    Reason (R) : If the output of a shift register is feedback to serial input it can be used as a ring counter.

25. **Assertion (A)** : Stack memory is LIFO

    Reason (R) : Stack pointer can be initialised to lowest address of stack memory.

26. **Assertion (A)** : int a; is a non-executable statements.

    Reason (R) : Processor is used to allocate memory for declared variables.

27. **Assertion (A)** : Electromagnetic waves acquire an apparent velocity greater than velocity of light in space.

    Reason (R) : Electromagnetic waves exhibit TEM characteristics.

28. **Assertion (A)** : Modulation facilitates use of practicable antenna.

    Reason (R) : Modulation reduces the bandwidth

29. **Assertion (A)** : Inverters and choppers use fast switching thyristors.

    Reason (R) : Fast switching SCR has low turn of time.

30. **Assertion (A)** : Thermocouple instruments can be used for ac only.

    Reason (R) : Thermocouple instrument has a non linear scale.

31. Following are the regions :
    1. SiO_2
    2. Reverse P-N junction
    3. n^- region
    4. p^+ region
    Arrange these in the increasing order of conductivity.
    (A) 1, 2, 3, 4   (B) 3, 4, 2, 1
    (C) 4, 3, 2, 1   (D) 1, 3, 2, 4

32. Following are the transistors :
    1. BC 107
    2. 2N 3055
    3. SL 100
    Arrange these transistors in the decreasing order of power handling capacity.
    (A) 2, 1, 3   (B) 2, 3, 1
    (C) 1, 2, 3   (D) 3, 2, 1

33. Consider the following for 8085 :
    1. LXI
    2. STA
    3. DAA
    4. ADD M
    Arrange these in terms of increasing order of number of machine cycles.
    (A) 4, 3, 1, 2   (B) 3, 4, 1, 2
    (C) 2, 4, 1, 3   (D) 1, 2, 3, 4

34. Consider the following blocks in PCM receiver :
1. Reconstruction filter
2. Regenerative circuit
3. Decoder
Arrange these in the order from input to output.
(A) 1, 2, 3   (B) 2, 1, 3
(C) 3, 2, 1   (D) 2, 3, 1

35. Consider the following fibers :
1. Plastic clad fiber
2. Plastic fiber
3. Silica fiber
Arrange them in the increasing order of loss.
(A) 1, 2, 3   (B) 3, 2, 1
(C) 3, 1, 2   (D) 1, 3, 2

Directions : Q. No. 36 to 45 :
In the following questions, match List – I and List – II select the correct answer using the codes given below the lists :

36.

	List – I		List – II
a.	BJT	i.	Narrow depletion region
b.	FET	ii.	Used for both AC as well as DC applications
c.	PN diode	iii.	High gain
d.	Tunnel diode	iv.	Low gain

Codes :

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

37.

	List – I		List – II
a.	Z_{11}	i.	Z_r
b.	Z_{12}	ii.	Z_o
c.	Z_{21}	iii.	Z_i
d.	Z_{22}	iv.	Z_f

Codes :

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

38.

	List – I		List – II
a.	Operational amplifier	i.	Low pass filter
b.	Astable Multivibrator	ii.	One capacitor
c.	Basic integrator	iii.	Two capacitances
d.	PLL	iv.	Class B stage

Codes :

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

39.

	List – I		List – II
a.	SRAM	i.	Bios memory
b.	DRAM	ii.	Cache memory
c.	Parallel Access	iii.	Main memory
d.	ROM	iv.	Register

Codes :

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

40.

	List – I		List – II
a.	Direct Addressing	i.	MOV A, M
b.	Register Addressing	ii.	LXI FOOOH
c.	Register Indirect	iii.	STA FFCOH
d.	Immediate Addressing	iv.	MOV C, A

Codes :

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

41.

	List – I		List – II
a.	Assembler	i.	Finds faults driving execution
b.	Compiler	ii.	Creates machine code
c.	Linker	iii.	Creates object file
d.	debugger	iv.	Creates executive file

Codes :

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

42.

	List – I		List – II
a.	Characteristic Impedance	i.	$\nabla \cdot D = \rho_v$
b.	Poynting vector	ii.	$\sqrt{\dfrac{j\omega\mu}{(\sigma + j\omega \in)}}$
c.	Displacement Current	iii.	$E \times H$
d.	Point form of Gauss law	iv.	$\dfrac{\delta D}{\delta t}$

Codes :

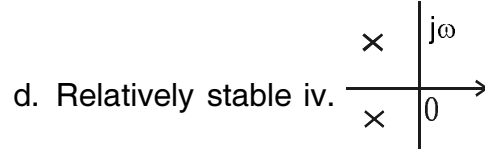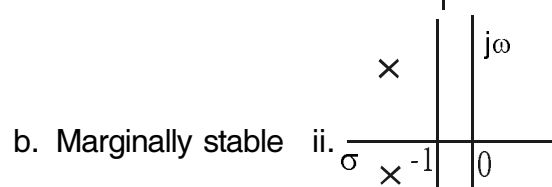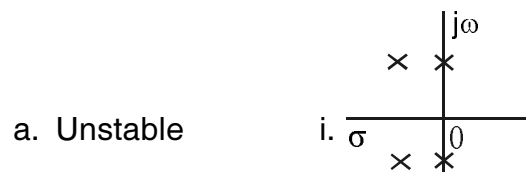|	a	b	c	d
(A)	i	iii	ii	iv
(B)	iii	iv	i	ii
(C)	ii	iii	iv	i
(D)	ii	i	iii	iv

43.

	List – I		List – II
a.	FM	i.	μ-law
b.	DM	ii.	capture effect
c.	PSK	iii.	slope overload
d.	PCM	iv.	matched filter

Codes :

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

44.

	List – I		List – II
a.	LASER	i.	Emit monochromatic light of low intensity
b.	Solar cell	ii.	Conduction due to incident light
c.	Photo diode	iii.	Power to load
d.	LED	iv.	Emit monochromatic light of high intensity

Codes :

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

45.

	List – I		List – II
a.	Unstable	i.	
b.	Marginally stable	ii.	
c.	Stable	iii.	
d.	Relatively stable	iv.	

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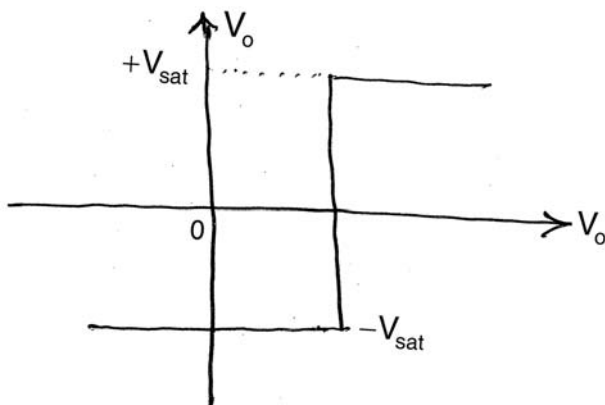
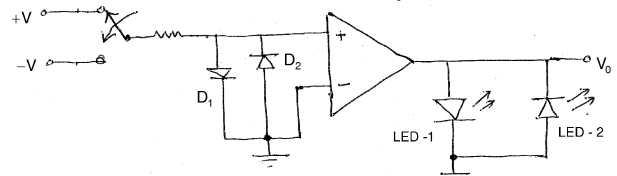|	a	b	c	d
(A)	iii	i	iv	ii
(B)	iv	iii	ii	i
(C)	iii	ii	i	iv
(D)	iv	i	ii	iii

Q. No. 46 to 50 :

A comparator circuit is a two-input, one-output building block that produces a high or low output depending upon the relative magnitudes of the two inputs. An op-amp can be very conveniently used as a comparator when used without negative feedback. Because of very large value of open-loop voltage gain, it produces either positively saturated or negatively saturated output voltage depending upon whether the amplitude of the voltage applied at the non-inverting input terminal is more or less positive than the voltage applied at the inverting input terminal. One of the inputs of the comparator is generally applied a reference voltage and the other input is fed with the input voltage that needs to be compared with the reference voltage. In a special case where the reference voltage is zero, the circuit is referred to as zero-crossing detector.

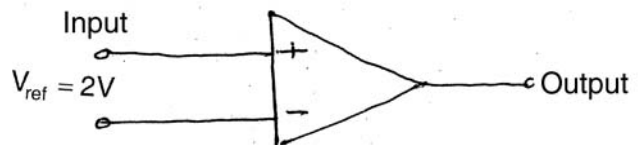**46.** The following figure shows transfer characteristics of an Op-Amp based circuit. It could possibly be

(A) An inverting comparator
(B) A non-inverting comparator
(C) An inverting amplifier with hysteresis
(D) A non-inverting amplifier with hysteresis

47. For the comparator circuit shown in following figure, diodes D_1 and D_2 have forward biased with voltage drop equal to 0.7 V each. What is the state of LED – 1 and LED – 2 (whether ON or OFF) when the switch SW – 1 is in position A ?

(A) LED – 1 ON, LED – 2 OFF
(B) LED – 1 ON, LED – 2 ON
(C) LED – 1 OFF, LED – 2 ON
(D) LED – 1 OFF, LED – 2 OFF

48. If the input to the ideal comparator shown in the following figure is a sinusoidal signal of 8V (peak-to-peak) without any dc component, then the output of the comparator has a duty cycle of

(A) $\dfrac{1}{2}$ (B) $\dfrac{1}{6}$

(C) $\dfrac{1}{3}$ (D) $\dfrac{1}{12}$

49. Which of the following are the non-linear applications of Op-Amp ?
  1. Current to voltage converter
  2. Comparator
  3. Peak detector
  4. Limiter
Select the correct answer from the codes given below
(A) 1, 2 and 3   (B) 2, 3 and 4
(C) 1, 3 and 4   (D) 1, 2 and 4

50. Why clamp diodes are used in comparator ?
(A) To reduce output offset voltage
(B) To increase gain of Op-Amp
(C) To reduce input offset voltage
(D) To protect Op-Amp from damage

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Space for Rough Work