Signature and Name of Invigilator

1. (Signature) _____

   (Name) _____

2. (Signature) _____

   (Name) _____

OMR Sheet No. : ....

(To be filled by the Candidate)

Roll No. | | | | | | | |

(In figures as per admission card)

Roll No. _____

(In words)

N 0 8 8 1 7

PAPER - II

ELECTRONIC SCIENCE

Time : 1¼ hours]

[Maximum Marks : 100

Number of Pages in this Booklet : **16**

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

| **Instructions for the Candidates**	**परीक्षार्थियों के लिए निर्देश**
1. Write your roll number in the space provided on the top of this page.	1. इस पृष्ठ के ऊपर नियत स्थान पर अपना रोल नम्बर लिखिए।
2. This paper consists of fifty multiple-choice type of questions.	2. इस प्रश्न-पत्र में पचास बहुविकल्पीय प्रश्न हैं।
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 :	3. परीक्षा प्रारम्भ होने पर, प्रश्न-पुस्तिका आपको दे दी जायेगी। पहले पाँच मिनट आपको प्रश्न-पुस्तिका खोलने तथा उसकी निम्नलिखित जाँच के लिए दिये जायेंगे, जिसकी जाँच आपको अवश्य करनी है :
(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.	(i) प्रश्न-पुस्तिका खोलने के लिए पुस्तिका पर लगी कागज की सील को फाड़ लें। खुली हुई या बिना स्टीकर-सील की पुस्तिका स्वीकार न करें।
(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.**	(ii) **कवर पृष्ठ पर छपे निर्देशानुसार प्रश्न-पुस्तिका के पृष्ठ तथा प्रश्नों की संख्या को अच्छी तरह चैक कर लें कि ये पूरे हैं। दोषपूर्ण पुस्तिका जिनमें पृष्ठ/प्रश्न कम हों या दुबारा आ गये हों या सीरियल में न हों अर्थात् किसी भी प्रकार की त्रुटिपूर्ण पुस्तिका स्वीकार न करें तथा उसी समय उसे लौटाकर उसके स्थान पर दूसरी सही प्रश्न-पुस्तिका ले लें। इसके लिए आपको पाँच मिनट दिये जायेंगे। उसके बाद न तो आपकी प्रश्न-पुस्तिका वापस ली जायेगी और न ही आपको अतिरिक्त समय दिया जायेगा।**
(iii) After this verification is over, the Test Booklet Number should be entered on the OMR Sheet and the OMR Sheet Number should be entered on this Test Booklet.	(iii) इस जाँच के बाद प्रश्न-पुस्तिका का नंबर OMR पत्रक पर अंकित करें और OMR पत्रक का नंबर इस प्रश्न-पुस्तिका पर अंकित कर दें।
4. Each item has four alternative responses marked (1), (2), (3) and (4). You have to darken the circle as indicated below on the correct response against each item.	4. प्रत्येक प्रश्न के लिए चार उत्तर विकल्प (1), (2), (3) तथा (4) दिये गये हैं। आपको सही उत्तर के वृत्त को पेन से भरकर काला करना है जैसा कि नीचे दिखाया गया है।
Example : ① ② ● ④ where (3) is the correct response.	उदाहरण : ① ② ● ④ जबकि (3) सही उत्तर है।
5. Your responses to the items are to be indicated in the **OMR Sheet given inside the Booklet only.** If you mark your response at any place other than in the circle in the OMR Sheet, it will not be evaluated.	5. प्रश्नों के उत्तर **केवल प्रश्न पुस्तिका के अन्दर दिये गये OMR पत्रक पर ही** अंकित करने हैं। यदि आप OMR पत्रक पर दिये गये वृत्त के अलावा किसी अन्य स्थान पर उत्तर चिह्नांकित करते हैं, तो उसका मूल्यांकन नहीं होगा।
6. Read instructions given inside carefully.	6. अन्दर दिये गये निर्देशों को ध्यानपूर्वक पढ़ें।
7. Rough Work is to be done in the end of this booklet.	7. कच्चा काम (Rough Work) इस पुस्तिका के अन्तिम पृष्ठ पर करें।
8. If you write your Name, Roll Number, Phone Number or put any mark on any part of the OMR Sheet, except for the space allotted for the relevant entries, which may disclose your identity, or use abusive language or employ any other unfair means, such as change of response by scratching or using white fluid, you will render yourself liable to disqualification.	8. यदि आप OMR पत्रक पर नियत स्थान के अलावा अपना नाम, रोल नम्बर, फोन नम्बर या कोई भी ऐसा चिह्न जिससे आपकी पहचान हो सके, अंकित करते हैं अथवा अभद्र भाषा का प्रयोग करते हैं, या कोई अन्य अनुचित साधन का प्रयोग करते हैं, जैसे कि अंकित किये गये उत्तर को मिटाना या सफेद स्याही से बदलना तो परीक्षा के लिये अयोग्य घोषित किये जा सकते हैं।
9. You have to return the original OMR Sheet to the invigilators at the end of the examination compulsorily and must not carry it with you outside the Examination Hall. You are however, allowed to carry original question booklet and duplicate copy of OMR Sheet on conclusion of examination.	9. आपको परीक्षा समाप्त होने पर मूल OMR पत्रक निरीक्षक महोदय को लौटाना आवश्यक है और परीक्षा समाप्ति के बाद उसे अपने साथ परीक्षा भवन से बाहर न लेकर जायें। हालांकि आप परीक्षा समाप्ति पर मूल प्रश्न-पुस्तिका तथा OMR पत्रक की डुप्लीकेट प्रति अपने साथ ले जा सकते हैं।
10. Use only Blue/Black Ball point pen.	10. केवल नीले/काले बाल प्वाईंट पेन का ही प्रयोग करें।
11. Use of any calculator or log table etc., is prohibited.	11. किसी भी प्रकार का संगणक (कैलकुलेटर) या लाग टेबल आदि का प्रयोग वर्जित है।
12. There are no negative marks for incorrect answers.	12. गलत उत्तरों के लिए कोई नकारात्मक अंक नहीं हैं।

N-08817

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P.T.O.

ELECTRONIC SCIENCE
PAPER - II

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

1.   The depletion region in a junction diode contains charges that are :
   (1)   Mobile donor and acceptor ion   (2)   Fixed donor and acceptor ion
   (3)   Mostly majority carriers   (4)   Mostly minority carriers

2.   For the circuit shown below, the value of R_L and maximum power are :

10 V $20\ \Omega$ $60\ \Omega$ $90\ \Omega$ $180\ \Omega$ R_L
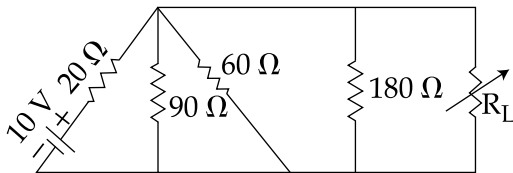
   (1) $6\ \Omega$ and 0.51 W   (2) $12\ \Omega$ and 0.6 W
   (3) $12\ \Omega$ and 0.75 W   (4)   cannot be calculated without knowing R_L

3.   In a full wave rectifier, the current in each of the diode flows for :
   (1)   Half cycle of input signal   (2)   Full cycle of input signal
   (3)   Quarter cycle of input signal   (4)   Three fourth cycle of input signal

4.   The Boolean SOP expression obtained from the truth table is :

Inputs			Output
A	**B**	**C**	**X**
0	0	0	0
0	0	1	1
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	1
1	1	1	0

   (1)   ABC' + A'BC   (2)   AB'C + ABC'   (3)   A'B'C + ABC'   (4)   A'BC' + AB'C

5. Which command word of 8251 indicates enter hunt mode ?

(1) D_0 (2) D_1 (3) D_6 (4) EH or D_7

6. Consider the 'C' statement printf ("%f",(float) 7/5); It prints :

(1) 1.0   (2) 1.4

(3) 2.0   (4) None of the above

7. The induction and radiation fields of an oscillating dipole becomes approximately equal at a distance 'R'. The value of 'R' is :

(1) $\lambda/6$ (2) $\lambda/4$ (3) $\lambda/3$ (4) $\lambda/2$

8. The ability of a receiver to discriminate against the interfering signals is known as :

(1) Selectivity   (2) Sensitivity   (3) Fidelity   (4) Distortion

9. An LED made of GaAs operates at a wavelength of 0.86 μm, The surrounding medium is air. The relative permittivity of GaAs is 12.9. The external quantum efficiency of the LED is :

(1) 2.31 %   (2) 23.1 %   (3) 13.1%   (4) 1.31 %

10. Sensitivity of potentiometer can be increased by :

(1) Decreasing the length of potentiometer wire

(2) Increasing the length of potentiometer wire

(3) Decreasing the current in potentiometer wire

(4) Decreasing the resistance in the rheostat in the series with the battery

11. The operation of JFET involves mainly :

(a) Flow of Minority carriers

(b) Flow of Majority carriers

(c) A very high input impedance

(d) Negative resistance

Which of the following is **correct** ?

(1) (b) and (c)   (2) (a) and (b)   (3) (c) and (d)   (4) (c) and (a)

12. Consider the following statements :

(a) Tellegen's theorem is applicable to any lumped networks

(b) The reciprocity theorem is applicable to linear bilateral networks

(c) Thevenin's theorem is applicable to two - terminal linear active networks

(d) Norton's theorem is applicable to two - terminal linear active networks

Which of the above statements are **correct** ?

(1) (a), (b) and (c) only (2) (a), (b) and (d) only

(3) (a), (b), (c) and (d) (4) (b), (c) and (d) only

13. The addition of two binary variables A and B results into a SUM and a CARRY output. Consider the following expressions for SUM and CARRY outputs.

(a) SUM $= A \cdot B + \overline{A}\overline{B}$ (b) SUM $= A \cdot \overline{B} + \overline{A} \cdot B$

(c) CARRY $= A \cdot B$ (d) CARRY $= A + B$

Which of the following expressions are **correct** ?

(1) (a) and (c) (2) (b) and (c) (3) (d) and (b) (4) (a) and (d)

14. What are the names of 16 - bit registers in 8085 ?

(a) SP (b) PC (c) Accumulator (d) W

Options :

(1) (a) and (b) are correct (2) (c) and (d) are correct

(3) (a), (b) and (c) are correct (4) (b), (c) and (d) are correct

15. Consider the following 'C' Program :

```c
# include <stdio.h>
int main ()
{
int max;
scanf ("%d", & max);
int a[max];
for (i=1; i<max; i++)
{
scanf ("%d", a[i]);
printf("%d \n", a[i]);
}
return 0;
}
```

Which of the following statements are correct : about the 'C' program given above ?

(a) The code is correct and runs successfully

(b) The code is erroneous since the statement declaring array is invalid

(c) The code is erroneous since the subscript for array used in 'for' loop is in the range 1 to max - 1

(d) The code is erroneous since the type declaration statement int a [max]; is done after scanf()

Options :

(1) (a) and (c)   (2) (b) and (c)   (3) (b) and (d)   (4) (c) and (d)

16. The radiation pattern of two non - directional radiators fed with equal currents (with a phase shift) shown in figure belongs to :
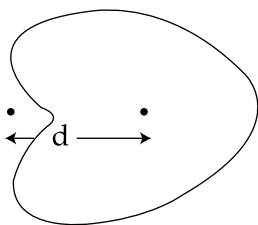
(a) $d = \lambda/2$ (b) $\alpha = -90°$ (c) $d = \lambda/4$ (d) $\alpha = 0°$

(1) (a) and (b) are correct   (2) (b) and (c) are correct

(3) (c) and (d) are correct   (4) (a) and (d) are correct

17. An FM detector produces a peak - to - peak output voltage of 1.2 V from an FM signal that is modulated to 10 kHz deviation by a sine wave.

(a)   The peak voltage is 0.6V

(b)   The detector sensitivity is 6 μV/Hz

(c)   The peak voltage is 2.4V

(d)   The detector sensitivity is 60 μV/Hz

Which of the above are **correct** ?

(1)   (a) and (b)   (2)   (b) and (c)   (3)   (c) and (d)   (4)   (a) and (d)

18. In the following circuit of buck - boost regulator :
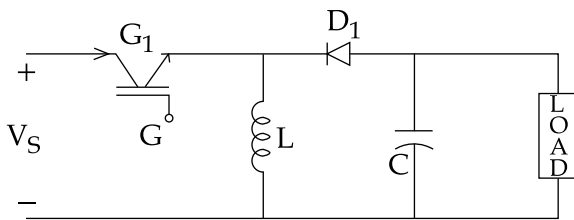
Input voltage = 12V, duty cycle = 0.25 and switching frequency = 25 kHz , L = 125 μH and C = 220 μF. The average load current = 1.25A. Following statements are given :

(a)   Average output voltage = 4.8 V

(b)   Peak to peak output ripple voltage = 5.68 V

(c)   Average output voltage = −4 V

(d)   Peak to peak output ripple voltage = 56.8 mV

Which one is **correct** option :

(1)   (a) and (b)   (2)   (b) and (c)   (3)   (c) and (d)   (4)   (a) and (d)

19. Consider the following statements regarding the steady - state error due to a step function input.

(a)   Type '0' system $e_{ss} = \dfrac{R}{1 + Kp}$

(b)   Type '0' system $e_{ss} = 0$

(c)   Type '1' system $e_{ss} = 0$

(d)   Type '1' system $e_{ss} = \infty$

Which of the above statements are **correct** ?

(1)   (a) and (b)   (2)   (b) and (c)   (3)   (a) and (c)   (4)   (a) and (d)

20. The Q point of a voltage amplifier is selected in the middle of the active region because :

(a) In this case it requires a small dc voltage

(b) The operating point becomes stable

(c) It gives distortion less output

(d) It is suitable for small input signals without distorted output

Which of the following is **correct** ?

(1) (b) and (d)　　(2) (c) and (d)　　(3) (a) and (d)　　(4) (b) and (a)

21. Match the following list :

List - I		List - II	
(a)	Resist on UV exposure undergoes cross-linking	(i)	+ve resist
(b)	Resist on UV exposure under goes decomposition reaction	(ii)	−ve photoresist
(c)	Space charge width at zero bias for M−S contact	(iii)	$n.p = n_i^2$
(d)	Law of mass action	(iv)	$\left[\dfrac{2\epsilon_s V_{bi}}{qN_D}\right]^{1/2}$

Correct code are :

Code :

	(a)	(b)	(c)	(d)
(1)	(ii)	(i)	(iv)	(iii)
(2)	(iii)	(ii)	(i)	(iv)
(3)	(ii)	(iii)	(iv)	(i)
(4)	(i)	(ii)	(iv)	(iii)

22. Match the following list :

List-I	List-II
(a) $a \oplus b = 0$	(i) $a \neq b$
(b) $\overline{a + b} = 0$	(ii) $a = b$
(c) $\bar{a} \cdot b = 0$	(iii) $a = 1$ or $b = 1$
(d) $a \oplus b = 1$	(iv) $a = 1$ or $b = 0$

Correct code are :

Code :

	(a)	**(b)**	**(c)**	**(d)**
(1)	(iii)	(ii)	(i)	(iv)
(2)	(ii)	(iii)	(iv)	(i)
(3)	(iii)	(ii)	(iv)	(i)
(4)	(ii)	(iii)	(i)	(iv)

23. Match the following list :

List-I	List-II
(a) In half wave Rectifier dc voltage across load approximately for $(r_d \ll R_L)$	(i) $\dfrac{V_m}{\pi}$
(b) Rectification efficiency of full wave rectifier in % is	(ii) $\beta = \dfrac{1}{29}$
(c) Gain of amplifier in dB	(iii) $\dfrac{81.2}{1 + r_d/R_L}$
(d) Feedback factor when RC network is phase shift oscillator gives exactly 180° phase shift	(iv) $20 \log_{10} \dfrac{V_2}{V_1}$

Correct code are :

Code :

	(a)	**(b)**	**(c)**	**(d)**
(1)	(ii)	(i)	(iii)	(iv)
(2)	(i)	(iii)	(iv)	(ii)
(3)	(iii)	(ii)	(iv)	(i)
(4)	(iv)	(iii)	(ii)	(i)

24. Match the following list :

	List-I		List-II
	(Octal)		(Decimal)
(a)	35	(i)	53
(b)	65	(ii)	62
(c)	54	(iii)	29
(d)	76	(iv)	44

Correct code are :

Code :

	(a)	(b)	(c)	(d)
(1)	(iii)	(ii)	(iv)	(i)
(2)	(iv)	(iii)	(ii)	(i)
(3)	(ii)	(iii)	(i)	(iv)
(4)	(iii)	(i)	(iv)	(ii)

25. Match the following list :

	List-I		List-II
	(8085 Instruction)		(Addressing mode)
(a)	LXI H, 3400 H	(i)	Direct
(b)	STA 3600 H	(ii)	Register Indirect
(c)	STA X B	(iii)	Immediate
(d)	ADD B	(iv)	Register

Correct code are :

Code :

	(a)	(b)	(c)	(d)
(1)	(iv)	(ii)	(i)	(iii)
(2)	(i)	(iii)	(iv)	(ii)
(3)	(iii)	(i)	(ii)	(iv)
(4)	(iii)	(iv)	(ii)	(i)
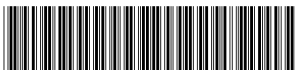
26. Match the following list :

	List-I		List-II
(a)	DIMENSION	(i)	Operator
(b)	enum	(ii)	Macro
(c)	new	(iii)	Data type
(d)	# define	(iv)	Non - executable

Correct code are :

Code :

	(a)	(b)	(c)	(d)
(1)	(iii)	(i)	(ii)	(iv)
(2)	(i)	(ii)	(iv)	(iii)
(3)	(iv)	(iii)	(i)	(ii)
(4)	(ii)	(iv)	(iii)	(i)

27. Match the following lists in terms of directivity of the antennas :

	List-I		List-II
(a)	Short dipole	(i)	1.64
(b)	$\lambda/4$ Monopole	(ii)	6.8
(c)	$\lambda/2$ Monopole	(iii)	3.28
(d)	$\lambda/2$ dipole	(iv)	1.5

Correct code are :

Code :

	(a)	(b)	(c)	(d)
(1)	(i)	(ii)	(iii)	(iv)
(2)	(iv)	(ii)	(i)	(iii)
(3)	(iv)	(iii)	(ii)	(i)
(4)	(iii)	(iv)	(ii)	(i)

28. Match the following list :

	List-I (Codes)		List-II (No. of Bits used)
(a)	Baudot code	(i)	7 bits
(b)	ASCII code	(ii)	5 bits
(c)	EBCDIC code	(iii)	10 digits
(d)	Code 39	(iv)	8 bits

Correct code are :

Code :

	(a)	(b)	(c)	(d)
(1)	(ii)	(i)	(iv)	(iii)
(2)	(i)	(ii)	(iii)	(iv)
(3)	(ii)	(i)	(iii)	(iv)
(4)	(iv)	(iii)	(ii)	(i)

29. Match the following list :

	List-I		List-II
(a)	Crest factor	(i)	$\sqrt{\dfrac{I_s^2 - I_{s_1}^2}{I_{s_1}^2}}$
(b)	Harmonic factor	(ii)	$\cos \phi$
(c)	Displacement power factor	(iii)	$\dfrac{\Delta V_o}{V_o \text{ average}}$
(d)	Power factor	(iv)	$\dfrac{I_s \text{ (Peak)}}{I_s}$

Correct code are :

Code :

	(a)	(b)	(c)	(d)
(1)	(ii)	(iii)	(iv)	(i)
(2)	(iv)	(i)	(ii)	(iii)
(3)	(iii)	(iv)	(i)	(ii)
(4)	(iv)	(ii)	(i)	(iii)

30. Match the following list :

	List-I		List-II
(a)	Amplidyne	(i)	Three axes device
(b)	Resolver	(ii)	Dynamo-electric amplifier
(c)	Gyroscope	(iii)	Rotatory transformer
(d)	Accelerometer	(iv)	Inertial measurement

Correct code are :

Code :

	(a)	(b)	(c)	(d)
(1)	(i)	(iii)	(ii)	(iv)
(2)	(ii)	(i)	(iv)	(iii)
(3)	(ii)	(iii)	(i)	(iv)
(4)	(i)	(ii)	(iii)	(iv)

31. The correct sequence of TTL logic chip in decreasing order of their gate delay time is :

(a) 74 L 00   (b) 74 S 00   (c) 74 LS 00   (d) 74 H 00

Code :

(1) (a), (b), (c), (d)   (2) (a), (c), (d), (b)

(3) (a), (c), (b), (d)   (4) (b), (a), (d), (c)

32. Following are the incident radiation used for lithography while making integrated circuit (depending upon the feature size).

(a) Visible light   (b) Electron beam   (c) Ion beam   (d) UV light

Sequence the radiation used for increasing order of the feature size :

Code :

(1) (c), (b), (d), (a)   (2) (b), (a), (d), (c)   (3) (a), (b), (c), (d)   (4) (a), (d), (b), (c)

33. Which of the following is correct sequence of evaluation for the 'C' expression given below ?

R = A + B*R/4%2 − 1 ;

(1) − % / * + =   (2) / * % − + =   (3) * / % − + =   (4) * / % + − =

34. Arrange the following in terms of theoretical attenuation in ascending order for a distance of 100 ft from the transmitter.

(a) Ku band   (b) X band   (c) L band   (d) S band

The correct sequence of attenuation in ascending order is :

Code :

(1) (c), (d), (b), (a)   (2) (a), (b), (c), (d)

(3) (a), (b), (d), (c)   (4) (d), (b), (c), (a)

35. Consider the following circuit models.

(a) Integrator

(b) Proportional + Derivative

(c) Proportion + Integral + Derivative

Arrange the above circuit models in decreasing order of their circuit complexity :

Code :

(1) (a), (b), (c)   (2) (a), (c), (b)   (3) (b), (a), (c)   (4) (c), (b), (a)

Directions : Question No. **36** to **45** :

The following items consist of two statements, one labelled as **"Assertion (A)"** and the other labelled as the **"Reason (R)"**. You are 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 code given below and mark your answer accordingly.

Code :

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

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

(3)   **(A)** is true, but **(R)** is false

(4)   **(A)** is false, but **(R)** is true

36.   **Assertion (A) :** Tunnel diode characteristics have negative resistance region.

        Reason (R) :   Tunnel diode can be used as rectifier.

37.   **Assertion (A) :** Q factor of a series resonant circuit is $\dfrac{1}{R}\sqrt{\dfrac{L}{C}}$

        Reason (R) :   High Q means better selectivity.

38.   **Assertion (A) :** For making integrated circuit the type of lithography chosen depends upon the feature size.

        Reason (R) :   UV lithography can easily be used for making nano size circuits.

39.   **Assertion (A) :** In a parallel - in - serial out shift register data is loaded one bit at a time.

        Reason (R) :   A serial - in - serial out shift register can be used to introduce time delay in the circuits.

40.   **Assertion (A) :** Architecturally 8086 μp is totally different from its predecessor 8085 μp but functionally it is downward compatible with 8085.

        Reason (R) :   The segmented architecture was introduced in 8086 μp to keep compatibility with 8085 μp.

41. **Assertion (A) :** If 'char a[10];' is defined in one file and 'extern char *a;' is declared in another file then it does not work.

   Reason (R) : The declaration 'extern char *a;' does not declare an array and therefore does not match the actual definition.

42. **Assertion (A) :** A high electron mobility transistor is based upon modulation doped (GaAs - Al GaAs) single heterojunction structure.

   Reason (R) : HEMT shows very high noise figure and very low gain at very high microwave frequencies upto 70 GHz.

43. **Assertion (A) :** Shot noise is due to random variations in current flow in active devices.

   Reason (R) : Current is a flow of carriers each of which carries a finite amount of charge.

44. **Assertion (A) :** In a two transistor model the anode current is given by :

$$I_A = \frac{\alpha_2 I_G + I_{CBO_1} - I_{CBO_2}}{I + (\alpha_1 - \alpha_2)}$$

   Reason (R) : The regenerative or Latching action due to a positive feedback is demonstrated in a two transistor model of a thyrister. It contains a pnp & a npn transistors.

45. **Assertion (A) :** The closed loop pole - zero dipole introduced by PI controller does not contribute significantly to the transient response of the closed loop system.

   Reason (R) : The PI controller adds a pole at s = 0 and a zero at s = −z to the closed loop transfer function.

Based on the following para, answer Q. No. 46 to 50 :

Antennas are used to transmit and receive signals. The basic theory behind them is given by Maxwell's equations and electromagnetics. Its size depends upon the frequency used. Higher is the frequency lower are the dimension of antennas. Antennas are of various types, like resonant, non - resonant etc. They are different for different applications.

46. If 'Z' is the impedance of a simple dipole, the impedance of 'n' fold dipole is given by :

   (1) n Z   (2) $n^2 Z$ (3) Z/n   (4) Z/n^2

47. The directivity of a small loop and a short dipole has the following ratio :

(1) 2 : 1   (2) 1 : 2   (3) 1 : 1   (4) 1 : 4

48. Patch is a :

(1) High gain wide band antenna   (2) High gain narrow band antenna

(3) Low gain narrow band antenna (4) Low gain wide band antenna

49. The maximum gain for H - plane sectoral horn with slant length of 12 λ occurs when aperture width is :

(1) λ   (2) 3 λ   (3) 6 λ   (4) 12 λ

50. Helical antennas are often used for satellite tracking in VHF range because of :

(1) Troposcatter   (2) Super - refraction

(3) Ionospheric refraction   (4) Faraday effect

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Space For Rough Work