PAPER-II
ELECTRONIC SCIENCE

Signature and Name of Invigilator

1. (Signature) _____

   (Name) _____

2. (Signature) _____

   (Name) _____

| J | A | 0 | 8 | 8 | 1 | 7 |

Time : 1 ¹/₄ hours]

OMR Sheet No. : ....

(To be filled by the Candidate)

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

(In figures as per admission card)

Roll No._____

(In words)

[Maximum Marks : **100**

Number of Pages in this Booklet : **16**	Number of Questions in this Booklet : **50**

Instructions for the Candidates

1. Write your roll number in the space provided on the top of this page.
2. This paper consists of fifty 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 is 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.**
   (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.
   (iv) The test booklet no. and OMR sheet no. should be same. In case of discrepancy in the number, the candidate should immediately report the matter to the invigilator for replacement of the Test Booklet / OMR Sheet.
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.
   Example : ① ② ● ④
   where (3) is the correct response.
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.
6. Read instructions given inside carefully.
7. Rough Work is to be done in the end of this booklet.
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.
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 on conclusion of examination.
10. **Use only Black Ball point pen.**
11. **Use of any calculator or log table etc., is prohibited.**
12. **There is no negative marks for incorrect answers.**

परीक्षार्थियों के लिए निर्देश

1. इस पृष्ठ के ऊपर नियत स्थान पर अपना रोल नम्बर लिखिए ।
2. इस प्रश्न-पत्र में पचास बहुविकल्पीय प्रश्न हैं ।
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) 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) 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 अर्थात 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) 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 ।
   (iv) प्रश्न पुस्तिका नं. और OMR पत्रक नं. समान होने चाहिए । यदि नंबर भिन्न हों, तो परीक्षार्थी प्रश्न-पुस्तिका / OMR पत्रक बदलने के लिए निरीक्षक को तुरंत सूचित करें ।
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 ।
   उदाहरण : ① ② ● ④
   जबकि (3) सही उत्तर है ।
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. अन्दर दिये गये निर्देशों को ध्यानपूर्वक पढ़ें ।
7. कच्चा काम (Rough Work) इस पुस्तिका के अन्तिम पृष्ठ पर करें ।
8. यदि आप OMR पत्रक पर नियत स्थान के अलावा अपना नाम, रोल नम्बर, फोन नम्बर या कोई भी ऐसा चिन्ह 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. 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 अपने साथ ले जा सकते हैं ।
10. काले बाल प्वाईंट पेन का ही इस्तेमाल करें ।
11. किसी भी प्रकार का संगणक (कैलकुलेटर) या लाग टेबल आदि का प्रयोग वर्जित है ।
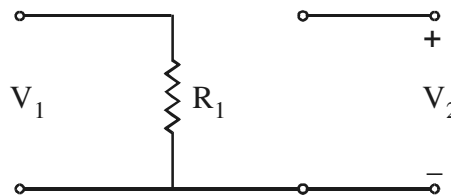12. गलत उत्तरों के लिए कोई नकारात्मक अंक नहीं हैं ।

JA-088-17

1

P.T.O.

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

1. The ionised concentration for donors is given by :

(1) $\dfrac{N_D}{1 + 2 \exp [(E_F - E_D) / KT]}$

(2) $\dfrac{N_D}{1 - 2\exp [(E_F - E_D) / KT]}$

(3) $\dfrac{N_D}{1 + \exp [(E_F - E_D) / KT]}$

(4) $\dfrac{N_D}{1 - \exp [(E_F - E_D) / KT]}$

2. The [Y] parameters of the network shown below are given as :

(1) $\begin{bmatrix} \dfrac{1}{R_1} & \dfrac{1}{R_1} \\ \dfrac{1}{R_1} & \dfrac{1}{R_1} \end{bmatrix}$

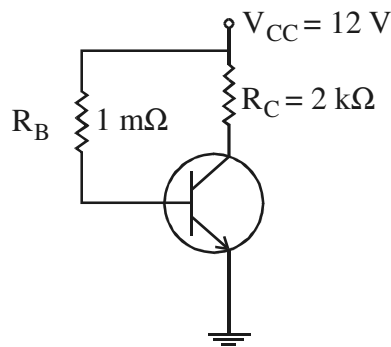(2) $\begin{bmatrix} 0 & \dfrac{1}{R_1} \\ \dfrac{1}{R_1} & \dfrac{1}{R_1} \end{bmatrix}$

(3) $\begin{bmatrix} \dfrac{1}{R_1} & 0 \\ 0 & 0 \end{bmatrix}$

(4) $\begin{bmatrix} \dfrac{1}{R_1} & 0 \\ 0 & \dfrac{1}{R_1} \end{bmatrix}$

3. In a circuit shown below, the base current is

(1) 12.0 µA

(2) 11.3 µA

(3) 6.0 µA

(4) 0.7 µA

4. The output of the circuit is given by :

(1) A + C

(2) B + C

(3) A + B

(4) A + $\overline{C}$

5. For queue to be idle state in 8086

(1) $QS_0 = 0$, $QS_1 = 0$

(2) $QS_0 = 1$, $QS_1 = 0$

(3) $QS_0 = 0$, $QS_1 = 1$

(4) $QS_0 = 1$, $QS_1 = 1$

6. Which of the following is incorrect reference to the array in FORTRAN :

(1) A (2, 5)

(2) A (2 * 3, 6)

(3) A (N, X)

(4) A (LOCATION, 8)

7. The normalized impedance of a transmission line is given by expression :

(1) Z_O / Z_{in}

(2) $\sqrt{Z_{SC} \cdot Z_{OC}}$

(3) $Z_O \cot \gamma_L$

(4) $\dfrac{|V_{max}|}{|I_{max}| \cdot Z_O}$

8. Which of the following is associated with single balanced modulator circuit :

(1) Single side band transmission

(2) double side band transmission

(3) Vestigial side band transmission

(4) Double side band with full carrier transmission

9. A f_m kc / s modulating frequency provides $M_f = 2$ (significant Bessel functions i.e. n = 4) in F.M. Wave. What bandwidth is required for passing this wave keeping Δf constant , if frequency of modulating signal is doubled what will be its effect on M_f ?

    (1) M_f would be doubled

    (2) M_f would remain unchanged

    (3) M_f would reduces to $\frac{1}{2}$ of original value

    (4) M_f would reduces to $\frac{1}{4}$ of original value

10. The Nyquist plot of a system is given below :
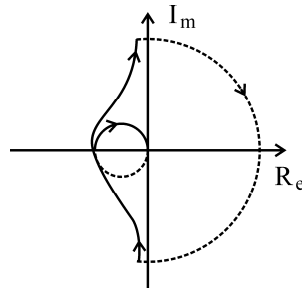
    The system is of type
    (1) Zero system   (2) One system
    (3) Two system   (4) Three system

11. In a half wave rectifier the open circuit voltage from the secondary of the transformer is $V_S = V_m \sin \omega t$, then the peak value of load current will be (R_f is dynamic resistance of diode and R_S is resistance of transformer secondary)

    (1) $\dfrac{V_m}{R_L + R_S}$ (2) $\dfrac{V_m}{R_S + R_f + R_L}$

    (3) $\dfrac{V_m}{R_f + R_S - R_f}$ (4) $\dfrac{V_m}{R_L - R_f - R_S}$

12. Read the following statements regarding a typical filter.
    (a) The characteristic impedance of a filter must be chosen such that the filter may be fit into a given line.
    (b) The cutoff frequency of a filter demarcates the pass-band and the stop-band.
    (c) A typical filter must have very high attenuation in the pass band.
    (d) A typical filter must have very low attenuation in stop-band.
    Which of the above statements are correct :
    (1) (a) and (b) are correct   (2) (b) and (c) are correct
    (3) (c) and (d) are correct   (4) (b) and (d) are correct

13. The voltage gain of a bipolar junction transistor in common emitter configuration is :

(a) $-\dfrac{h_{fe}R_L}{h_{ie}}$

(b) $-h_{fe}R_L$

(c) $-\dfrac{h_{fe}R_L}{R_i}$

(d) $1-\dfrac{h_{ie}}{R_i}$

Of the above statement :

(1)   (a) is correct but (b) is wrong.

(2)   (b) and (c) are correct.

(3)   (c) is correct but (d) is wrong.

(4)   (c) and (d) are correct.

14. The binary number 1 1 0 0 1 1 is to be converted to gray code. The number of gates and type of gates required are :

(a)   AND gate

(b)   6 gates

(c)   XOR gate

(d)   5 gates

The correct answer is :

(1)   (a) and (b)

(2)   (b) and (c)

(3)   (c) and (d)

(4)   (a) and (d)

15. In microprocessor 8086

(a)   The 8086 is a 16 bit processor with 16 bit internal and external data bus.

(b)   The instruction queue (IQ) length is of 4 bytes.

(c)   While entering HLT in minimum mode ALE is delayed.

(d)   The control pin in 8086 is $M\,\overline{|IO}$

Out of the following which one is correct :

(1)   (a) and (b) are correct.

(2)   (a) and (c) are correct.

(3)   (a) and (d) are correct.

(4)   (b) and (d) are correct.

16. Operation 'a = a * b + a' can also be written as :

(a)   a * = b + 1 ;

(b)   (a * b) ! = (b + a) ;

(c)   a = (b + 1) * a ;

(d)   a * = b + a

(1)   (a) and (d) are correct.

(2)   (b) and (c) are correct.

(3)   (c) and (d) are correct.

(4)   (a) and (c) are correct.

17. A lossless line has a characteristic impedance of 50 ohms. It is terminated in a load resistance of 75 ohms. The line is energised by a generator which has an output impedance of 50 ohms and an output voltage of 30 V (rms). The line is assumed to be 2.25 wavelength long. The input impedance and instantenous load voltages are given :

(a) Z_{in} = 50 ohms

(b) V_L (instaneous) = 36 V

(c) Z_{in} = 33.33 ohms

(d) V_L (instaneous) = 12 V

Which of the above are correct :

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

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

18. Which of the following statements are incorrect :

(a) In a frequency modulation system, the frequency of the carrier wave is varied in accordance to the frequency of the modulating signal.

(b) In PAM, there is a greater peak power compared to conventional amplitude modulation systems.

(c) In a PCM, the sampled amplitude is directly taken for conversion to a code of pulses.

(d) The noise in a PCM system is reduced by increasing the number of quantising levels.

Options :

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

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

19. Which of the following statements are correct :

(a) ASK gives a maximum probability of error.

(b) FSK is also known as ON-OFF keying.

(c) In DPSK, no synchronous carrier is needed at the receiver.

(d) Probability of Error in DPSK is less than BPSK.

Options :

(1) (a), (c) and (d) are correct.　　　(2) (a) and (c) are correct.

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

20. Read the following rules to sketch the root loci using poles and zeroes of $G(s)$ $H(s)$.

(a) The root loci starts at the poles $(K = 0)$.

(b) The root loci ends at the poles $(K = \infty)$.

(c) The root loci ends at the zero $(K = \infty)$.

(d) The root loci starts at the zero $(K = 0)$.

Which of the above rules are correct ?

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

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

21. Match the following lists :

List – I　　　　　　　　　　**List – II**

a. Junction depth　　　　　i. $N_A x_1 = N_D x_2$

b. Junction built in voltage

　　　　　　　　　　　　　ii. $\sqrt{\dfrac{2\epsilon_{si}}{qN_A}\phi_o}$

c. Charge neutrality condition

　　　　　　　　　　　　　iii. $\dfrac{kT}{q}\,ln\left(\dfrac{N_A N_D}{n_i^2}\right)$

d. Law of mass action　　　iv. $n.p = n_i^2$

Codes :

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

22. Match the following lists :

List – I　　　　　**List – II**

a. 1　　　　　　　　i. $\pi\delta(\omega) + \dfrac{1}{j\omega}$

b. u(t)　　　　　　ii. 1

c. δ(t)　　　　　iii. $\dfrac{-2}{\omega^2}$

d. | t |　　　　　　iv. $2\,\pi\delta(\omega)$

Codes :

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

23. Match the following lists :

	List – I		List – II
a.	William Shockley	i.	BJT
b.	Kilby	ii.	Tunnel diode
c.	Essaki	iii.	Integrated circuit
d.	Lilleanfield	iv.	MOSFET

Codes :

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

24. Match the following lists :

	List – I		List – II
a.	IC 7400	i.	Quad 2-input NOR gate
b.	IC 7402	ii.	Quad 2-input AND gate
c.	IC 7408	iii.	Quad 2-input OR gate
d.	IC 7432	iv.	Quad 2-input NAND gate

Codes :

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

25. Match the following lists in 8255 :

List – I	List – II
(Port/Control Register)	**(Address)**
a. Control Register	i. 01
b. Port A	ii. 00
c. Port B	iii. 10
d. Port C	iv. 11

Codes :

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

26. Match the following vertical control characters in FORTRAN with their effects :

List – I	List – II
a. ɸ (blank)	i. Overprint
b. 0 (zero)	ii. Eject page
c. 1 (one)	iii. Double space
d. + (plus)	iv. Single space

Codes :

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

27. Match the following lists in terms of relative permittivity :

List – I		List – II	
a.	Air	i.	25
b.	Alcohol (Ethyl)	ii.	4 to 7
c.	Glass	iii.	80
d.	Fresh water	iv.	1

Codes :

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

28. Match the following :

List – I	List – II
(Digital Modulation System)	**(Probability of Error)**

a. ASK $\qquad$ i. $\dfrac{1}{2} \exp\left[\dfrac{-A_c{}^2T_b}{2N_0}\right]$

b. PSK $\qquad$ ii. $Q\sqrt{\dfrac{A_c{}^2T_b}{2N_0}}$

c. FSK $\qquad$ iii. $Q\sqrt{\dfrac{A_c{}^2T_b}{4N_0}}$

d. DPSK $\qquad$ iv. $Q\sqrt{\dfrac{A_c{}^2T_b}{N_0}}$

Codes :

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

29. Match the following lists :

List – I		List – II
a.	$\Pi\, a.NA/\lambda$	i. attenuation factor (dB/km)
b.	$^{10}\log_{10}\left(\dfrac{P_{in}}{P_{out}}\right)$	ii. Intermodal time delay
c.	$\dfrac{l}{L}\dfrac{dtg}{d\lambda}$	iii. Dispersion causing pulse spreading
d.	$\dfrac{L(n_1 - n_2)n_1}{n_2 c}$	iv. Number of modes produced by an optical fibre

Codes :

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

30. Match the following lists :

List – I	List – II
a. Lag	i. Increase bandwidth
b. Leod	ii. Attenuation
c. Lag leod	iii. Increases damping factor
d. Rate	iv. Second order

Codes :

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

Directions : Q. Nos. (31 to 40) :

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 codes given below and mark your answer accordingly.

Codes :

(1)   Both (A) and (R) are true and (R) is 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.

31.   **Assertion (A) :** The value of thin film resistor can be changed even after fabrication.

   Reason (R) : This is done by means of trimming.

32.   **Assertion (A) :** Network analysis based on the state equations is known as state variable method of analysis.

   Reason (R) : The first order differential equation is easily programmed for computer solution.

33.   **Assertion (A) :** Tunnel diode is used as rectifier.

   Reason (R) : The tunnel diode is made of degenerate semiconductors.

34.   **Assertion (A) :** A decoder is dissimilar to a demultiplexer.

   Reason (R) : There is no data input in a decoder.

35.   **Assertion (A) :** For data transfer between 8085 microprocessor and memory, $\overline{CE}$ input of memory is connected to IO$|\overline{M}$ of microprocessor.

   Reason (R) : Microprocessor is enabled for data transfer when IO$|\overline{M}$ goes high.

36. **Assertion (A) :** The following program code in C

```
# include < stdio.h>
struct tryit
{
                char *str;
                int i ;
} t ;
int main ( )
{
     scanf("%s %d", t.str, & t.i) ;
     printf ("% s\n", t.str) ;
     return 0;
}
```

will cause compile time error.

Reason (R) : When pointer is not initialized then it holds garbage value.

37. **Assertion (A) :** In an impatt diode, for a transit angle larger than π and approaching $3\pi/2$, the negative resistance of the diode increases rapidly.

Reason (R) : The IMPATT diode consists of a high doping avalanche regions followed by a drift region.

38. **Assertion (A) :** A PI controller introduces a pole in the system thereby increasing the order and type of system by one.

Reason (R) : The increase in the type of the system ensures a decrease in the steady state error of the system.

39. **Assertion (A) :** Broadband techniques are used for communication of signals whether analog or digital.

Reason (R) : Broadband techniques are used when signals are incompatible with the baseband transmission media.

40. **Assertion (A) :** Attenuation and dispersion have negative effects on the propagation of signal in the optical fibres.

Reason (R) : Optical signal degradation is caused due to structural imperfections of the fibre material.

41. The following materials are given, arrange them in ascending order of their band gap :

(a) Germanium

(b) Carbon (diamond)

(c) Silicon carbide

(d) Aluminium Nitride

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

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

42. Consider the following signal flow graph.

Assume that

A is number of forward paths

B is number of feedback loops

C is number of touching loops

Arrange A, B and C in decreasing order :

(1) C > B > A   (2) B > C > A

(3) A > B > C   (4) C > A > B

43. Arrange the following services in the ascending order of their interrupt number in 'C' :

(a) Keyboard service   (b) Print screen service

(c) Video display service   (d) Memory size service

The correct order of sequence is :

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

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

44. Following materials are given, arrange them in ascending order of conductivity :

(a) Sea water   (b) Graphite

(c) Bronze   (d) Tungsten

The correct sequence is :

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

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

45. Arrange the below mentioned transmission lines in order of their increasing frequency handling capabilities :

(a) wave guide   (b) Parallel wire

(c) Rigid co-axial cables   (d) Flexible co-axial cables

Options :

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

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

Read the below passage and answer the question nos. **46 – 50 :**

Antennas are used for receiving and transmitting the electromagnetic signals. Their size depends upon the operating frequency / wavelength. Higher is the frequency, lower is the size of antenna. They work on Maxwell equations for field theory. They are of various types for different applications like TV transmission, AM transmission, FM transmission and satellite transmission. The waves travel in free space.

46. The free space wave number 'k_0' is defined as

(1) $k_0 = W_0 \sqrt{\mu_0 \in_0}$ (2) $k_0 = W_0 \sqrt{\mu_0 / \in_0}$

(3) $k_0 = W_0 / \sqrt{\mu_0 \in_0}$ (4) $k_0 = W_0 / \sqrt{\in_0 / \mu_0}$

47. The standard reference antenna for the directive gain is :

(1) Infinitesimal dipole   (2) Isotropic antenna

(3) Elementary dipole   (4) Half wave dipole

48. If Es is the field intensity vector identified as a phasor by its subscript 'S' and k_o is the wave number, equation

$\nabla^2 E_S = -k^2 E_S$ is known as :

(1) Vector Helmholtz equation   (2) Poisson's equation

(3) Coulombs gauge equation   (4) Diffusion equation

49. F_N a half wave dipole the directivity 'D' in dB is of the order of :

(1) 1.76 dB   (2) 3.14 dB

(3) 2.15 dB   (4) 1.64 dB

50. Which of the following antenna is not a wideband antenna ?

(1) Discone   (2) Helical

(3) Folded dipole   (4) Marconi

Space For Rough Work