

**PAPER-III**  
**ELECTRONIC SCIENCE**

**Signature and Name of Invigilator**

1. (Signature) \_\_\_\_\_  
(Name) \_\_\_\_\_
2. (Signature) \_\_\_\_\_  
(Name) \_\_\_\_\_

**J 8 8 1 3**

OMR Sheet No. : .....  
(To be filled by the Candidate)

Roll No. 

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(In figures as per admission card)

Roll No. \_\_\_\_\_  
(In words)

Time : 2 1/2 hours]

[Maximum Marks : 150

Number of Pages in this Booklet : 12

Number of Questions in this Booklet : 75

**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 :
  - To have access to the Question Booklet, tear off the paper seal / polythene bag on the booklet. Do not accept a booklet without sticker-seal / without polythene bag and do not accept an open booklet.
  - 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.**
  - After this verification is over, the OMR Sheet Number should be entered on this Test Booklet.
- 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) (C) (D)  
where (C) is the correct response.
- Your responses to the items are to be indicated in the **OMR Sheet given inside the Booklet only**. If you mark at any place other than in the circle in the OMR Sheet, it will not be evaluated.
- Read instructions given inside carefully.
- Rough Work is to be done in the end of this booklet.
- 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, you will render yourself liable to disqualification.
- 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 duplicate copy of OMR Sheet on conclusion of 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.

**परीक्षार्थियों के लिए निर्देश**

- पहले पृष्ठ के ऊपर नियत स्थान पर अपना रोल नम्बर लिखिए ।
- इस प्रश्न-पत्र में पचहत्तर बहुविकल्पीय प्रश्न हैं ।
- 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 :
  - प्रश्न-पुस्तिका खोलने के लिए पुस्तिका पर लगी कागज की सील / पॉलिथीन बैग को फाड़ लें । खुली हुई या बिना स्टीकर-सील / बिना पॉलिथीन बैग की पुस्तिका स्वीकार न करें ।
  - 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 ।
  - इस जाँच के बाद OMR पत्रक की क्रम संख्या इस प्रश्न-पुस्तिका पर अंकित कर दें ।
- प्रत्येक प्रश्न के लिए चार उत्तर विकल्प (A), (B), (C) तथा (D) दिये गये हैं । आपको सही उत्तर के वृत्त को पेन से भरकर काला करना है जैसा कि नीचे दिखाया गया है ।  
**उदाहरण :** (A) (B) (C) (D) जबकि (C) सही उत्तर है ।
- 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 ।
- अन्दर दिये गये निर्देशों को ध्यानपूर्वक पढ़ें ।
- कच्चा काम (Rough Work) इस पुस्तिका के अन्तिम पृष्ठ पर करें ।
- 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, तो परीक्षा के लिये अयोग्य घोषित किये जा सकते हैं ।
- 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 । हालाँकि आप परीक्षा समाप्ति पर OMR पत्रक की डुप्लीकेट प्रति अपने साथ ले जा सकते हैं ।
- केवल नीले/काले बाल प्वाइंट पेन का ही इस्तेमाल करें ।
- किसी भी प्रकार का संगणक (कैलकुलेटर) या लाग टेबल आदि का प्रयोग वर्जित है ।
- गलत उत्तरों के लिए कोई अंक काटे नहीं जाएँगे ।

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

**Note :** This paper contains **seventy five (75)** objective type questions of **two (2)** marks each.  
**All** questions are compulsory.

1. Semiconductor materials are made up of  
(A) Metallic bond  
(B) Ionic bond  
(C) Vander Waal's bond  
(D) Covalent bond
2. A UJT has  
(A) negative resistance characteristics  
(B) low firing current  
(C) bipolar device  
(D) relax indefinitely
3. The current in a zener diode is controlled by  
(A) zener diode resistance  
(B) potential barrier  
(C) impact ionization  
(D) external circuits resistance
4. The ripple factor of a half-wave rectifier is found to be  
(A) 1.57                      (B) 1.21  
(C) 1.12                      (D) 1.41
5. Hartley oscillator is commonly used in  
(A) Radio receivers  
(B) Radio transmitters  
(C) TV receivers  
(D) Microwave transmitters
6. The multiplexer is also known as  
(A) Counter  
(B) Decoder  
(C) Shift register  
(D) Data selector
7. Quantizing Noise occurs in  
(A) Time-division multiplexing  
(B) Frequency-division multiplexing  
(C) Pulse-Code modulation  
(D) Pulse width modulation
8. CMRR (Common Mode Rejection Ratio) for a differential amplifier should be  
(A) Zero                      (B) Unity  
(C) Small                      (D) Large
9. An ideal op-amp has  
(A) infinite common mode gain as well as differential gain.  
(B) infinite common mode gain and zero differential gain.  
(C) infinite differential gain and zero common mode gain.  
(D) zero differential gain and infinite common mode gain.
10. In 8085, example for Non-maskable interrupts are  
(A) Trap  
(B) RST 6.5  
(C) INTR  
(D) RSTO
11. The pH is a measure of  
(A) Acidity  
(B) Density  
(C) Specific density  
(D) Solubility

12. To separate channels in an FDM receiver, it is necessary to use
- (A) integration
  - (B) band pass filter
  - (C) differentiation
  - (D) AND gates
13. Time-Division Multiplex
- (A) can be used with PAM only
  - (B) combines five groups into a supergroup
  - (C) stacks 24 channels in adjacent frequency slots
  - (D) interleaves pulses in time domain belonging to different transmissions
14. In Half Duplex (HDX), data transmission is possible
- (A) in one direction
  - (B) in both direction
  - (C) in both direction, but not at the same time
  - (D) in both direction simultaneously
15. Indicate which of the following system is digital ?
- (A) Pulse – Position Modulation
  - (B) Pulse – Code Modulation
  - (C) Pulse – Width Modulation
  - (D) Pulse – Amplitude Modulation
16. The value of Numerical Aperture in optical fibre is
- (A) greater than 1
  - (B) less than 1
  - (C) equal to 1
  - (D) equal to  $\infty$
17. The Refractive Index of core in optical fibre should be
- (A) smaller than R.I. of cladding
  - (B) greater than R.I. of cladding
  - (C) equal to R.I. of cladding
  - (D) equal to air
18. SCR turns off from conducting state to blocking state on
- (A) reducing gate current
  - (B) reversing gate current
  - (C) reducing anode current below holding current value
  - (D) applying ac to the gate
19. The balanced modulator essentially is
- (A) an oscillator
  - (B) a mixer
  - (C) a product modulator
  - (D) an amplifier
20. Which semiconductor device acts like a diode and two resistors ?
- (A) UJT
  - (B) SCR
  - (C) Diac
  - (D) Triac
21. Which type of analog-to-digital converter is often used in digital voltmeter ?
- (A) Single slope A/D converter
  - (B) Dual slope A/D converter
  - (C) Successive approximation method
  - (D) Flash converter

22. Which of the following logic family is fastest of all ?  
 (A) TTL (B) RTL  
 (C) DCTL (D) ECL
23. Photoconductive devices are made of  
 (A) radioactive materials  
 (B) highly conductive materials  
 (C) semiconductor materials  
 (D) highly insulating materials
24. The unit of mobility of semiconductor is  
 (A)  $\text{m}^2 \text{v}^{-1} \text{s}^{-1}$   
 (B)  $\text{m v}^{-1} \text{s}^{-1}$   
 (C)  $\text{v s m}^{-1}$   
 (D)  $\text{v m s}^{-1}$
25. The figure of merit of logic family is given by  
 (A) gain bandwidth product  
 (B) (propagation delay time)  $\times$  (power dissipation)  
 (C) (fan out)  $\times$  (propagation delay time)  
 (D) (noise margin)  $\times$  (power dissipation)
26. In a 8085 microprocessor, the resistor which holds address of the next instruction to be fetched is  
 (A) Accumulator  
 (B) Program counter  
 (C) Stack pointer  
 (D) Instructor Register
27. If a carrier modulated by a digital bit stream had one of the possible phases of 0, 90, 180 and 270 degrees then modulation is called  
 (A) BPSK (B) FSK  
 (C) QPSK (D) QAM
28. The logic gate normally used to get the carry bit in a half adder is  
 (A) AND (B) EX-OR  
 (C) NOT (D) OR
29. A counter in which all the flip-flops receive the clock pulse at the same time is known as  
 (A) ripple counter  
 (B) synchronous counter  
 (C) clocked counter  
 (D) asynchronous counter
30. Which of the following devices is suitable for very low power oscillator circuits only ?  
 (A) TRAPATT diode  
 (B) IMPATT diode  
 (C) Gunn diode  
 (D) Tunnel diode
31. Thyristors can be turned off by  
 1. reducing the current below the holding current value  
 2. applying a negative voltage to the anode of the device  
 3. Reducing the gate current  
 Of these statements :
- Codes :**  
 (A) 1 & 2 are correct.  
 (B) 1 & 3 are correct.  
 (C) 2 & 3 are correct.  
 (D) 1, 2 & 3 are correct.

32. The 555 timer can be employed in

1. A monostable multivibrator
2. A bistable multivibrator
3. An astable multivibrator

Of these statements

**Codes :**

- (A) 1 & 2 are correct.
- (B) 1 & 3 are correct.
- (C) 2 & 3 are correct.
- (D) 1, 2 & 3 are correct.

33. When a plane wave propagating through free space, the direction of the field

1. 'E' is perpendicular to the direction of propagation.
2. 'H' is perpendicular to the direction of propagation.
3. 'E' is perpendicular to the direction of the field 'H'.

**Codes :**

- (A) 1 & 2
- (B) 2 & 3
- (C) 1 & 3
- (D) 1, 2 & 3

34. Consider the following statements regarding a semiconductor :

1. Acceptor level lies close to the valence band.
2. Donor level close to the valence band.
3. n-type semiconductor behaves as a conductor at zero Kelvin.
4. p-type semiconductor behaves as an insulator at zero Kelvin.

**Codes :**

- (A) 2 & 3 are correct.
- (B) 1 & 3 are correct.
- (C) 1 & 4 are correct.
- (D) 3 & 4 are correct.

35. A transducer converts

1. A potential difference is developed across a current carrying metal strip when the strip is placed in transverse magnetic field.
2. The Hall effect is very weak in metals but large in semiconductors.
3. The Hall effect is very weak in semiconductors but is large in metals.
4. It is applied in the measurement of the magnetic field intensity.

**Codes :**

- (A) 1, 2 & 3 only
- (B) 2 & 4 only
- (C) 1, 3 & 4 only
- (D) 1, 2 & 4 only

36. Consider the following statements :

1. Race around condition occurs in a JK flip-flop when both the inputs are one.
2. A flip-flop is used to store one bit of information.
3. A transparent latch consists in D-type in flip-flop.
4. Master-Slave configuration is used in flip-flop to store two bits of information.

Which of these statements are correct ?

**Codes :**

- (A) 1, 2 & 3 only
- (B) 1, 3 & 4 only
- (C) 1, 2 & 4 only
- (D) 2, 3 & 4 only

37. Consider the following :
1. Oscillator
  2. Emitter follower
  3. Cascaded amplifier
  4. Power amplifier
- Which of these use feedback amplifiers ?
- (A) 1 & 2                      (B) 1 & 3  
(C) 2 & 4                      (D) 3 & 4

38. Consider the following statements, regarding an Op-Amp :
1. All types of negative feedback reduce nonlinear distortion.
  2. All types of negative feedback reduce the output offset voltage.
  3. Non-inverting (current and voltage) feedback increases the input impedance.
  4. Inverting (current and voltage) feedback decreases input impedance.

**Codes :**

- (A) 1 only  
(B) 2 & 3 only  
(C) 2 & 4 only  
(D) 1, 2, 3 & 4 only

39. If an electric field is applied to an n-type semiconductor bar, the electrons and holes move in opposite directions due to their opposite charges. The net current is
1. due to both electrons and holes with electrons as majority carriers.
  2. the sum of electron and hole currents.
  3. the difference between electron and hole currents.

Which of these statements is/are correct ?

- (A) 1 & 3                      (B) 1 & 2  
(C) 2 & 3                      (D) 3 alone

40. A digital multiplexer can be used for which of the following ?
1. Parallel-to-serial conversion
  2. Many-to-one switch
  3. To generate memory chip select
  4. For code conversion
- Select the correct answer using the code given below :

**Codes :**

- (A) 1, 3 & 4                      (B) 2, 3 & 4  
(C) 1 & 2                      (D) 2 & 3

**Assertion – Reason type questions (Q. 41 to 50) :**

The following items consist 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 Intel 8085, the lower byte of address and data are multiplexed.

**Reason (R) :** This helps not to limit the number of external pin terminals.

42. **Assertion (A) :** In an Op-Amp circuit when one input terminal of the Op-Amp is grounded, the other terminal becomes a virtual ground.

**Reason (R) :** Input impedance of the Op-Amp is high.

**43. Assertion (A) :** The intrinsic Fermi level of a semiconductor lies exactly at the middle of the energy gap.

**Reason (R) :** The densities of the available state in valence and conduction bands of a semiconductor are equal.

**44. Assertion (A) :** The top down structured programming should be used for developing programs.

**Reason (R) :** The top down structured programming methodology enables us to get readable and easily provable programs.

**45. Assertion (A) :** A processor can reference a memory stack without specifying an address.

**Reason (R) :** The address is always available and automatically updated in the stack pointer.

**46. Assertion (A) :** In optical fibre communication, light rays are guided by the total internal reflection at the interface between fibre core and cladding.

**Reason (R) :** The Refractive Index of core is large than the Refractive Index of cladding.

**47. Assertion (A) :** Tunnel diode represents negative resistance characteristics and when operated in this region may be used as an oscillator.

**Reason (R) :** Tunnel diode is heavily doped p-n junction having an extremely narrow junction which electrons are able to tunnel through it.

**48. Assertion (A) :** The part of root locus on the real axis is not dependent upon the poles and zeros which are not on the real axis.

**Reason (R) :** Poles and zeros which are not on the real axis always occur in conjugate pairs.

**49. Assertion (A) :** A programmable Read-Only-Memory can be used as a synchronous counter.

**Reason (R) :** Each memory location of a programmable Read-Only-Memory is programmed and can be read synchronously.

**50. Assertion (A) :** A half-adder is faster than full-adder.

**Reason (R) :** A half-adder gives only one output while a full adder gives two outputs.

**51.** Consider the following circuit configurations :

1. Common emitter
2. Common base
3. Emitter follower
4. Emitter follower using Darlington pairs

The correct sequence in increasing order of the input resistances of these configuration is

- (A) 2, 1, 4, 3      (B) 1, 2, 4, 3  
(C) 2, 1, 3, 4      (D) 1, 2, 3, 4

**52.** Consider the Analog and Digital converters given below :

1. Successive Approximation ADC
2. Dual Ramp ADC
3. Counter Method ADC
4. Simultaneous ADC

The correct sequence of the ascending order in terms of conversion times of these ADC's is

- (A) 3, 2, 4, 1      (B) 2, 3, 4, 1  
(C) 2, 3, 1, 4      (D) 3, 2, 1, 4

53. Arrange the following in order of decreasing frequency :

1. C band
2. X band
3. Ku band
4. K band

Codes :

- (A) 1, 2, 3, 4      (B) 2, 3, 4, 1  
(C) 1, 4, 3, 2      (D) 4, 3, 2, 1

54. Consider the following cables :

1. Single mode optical fibre cable
2. Multimode optical fibre cable
3. Graded-index optical fibre cable
4. Co-axial cable

The correct sequence in increasing order of data rate is

- (A) 1, 2, 3, 4      (B) 4, 2, 3, 1  
(C) 1, 2, 4, 3      (D) 4, 3, 2, 1

55. The interrupts in 8085 processor are

1. RST 7.5
2. RST 6.5
3. RST 5.5
4. TRAP

Keep the sequence from least priority to highest priority

- (A) 1, 2, 3, 4      (B) 4, 3, 2, 1  
(C) 3, 2, 1, 4      (D) 1, 4, 3, 2

56. Consider the following frequency spectrum of the electro-magnetic wave :

1. FM radio waves
2. Microwaves
3. Visible range
4. X-ray

Write down the frequency spectrum in ascending order

- (A) 4, 3, 2, 1      (B) 1, 3, 2, 4  
(C) 3, 2, 4, 1      (D) 1, 2, 3, 4

57. Consider the following logic families:

1. MOS
2. TTL
3. RTL
4. ECL

The sequence of these logic families in the order of their increasing propagation delay is

- (A) 1, 2, 3, 4      (B) 4, 2, 3, 1  
(C) 2, 1, 3, 4      (D) 4, 3, 2, 1

58. Consider the following steps :

1. Etching
2. Exposure to UV radiation
3. Stripping
4. Developing

After a wafer has been coated with photo-resist, the correct sequence of these steps in photolithography is

- (A) 1, 4, 2, 3      (B) 2, 4, 1, 3  
(C) 2, 1, 3, 4      (D) 1, 3, 2, 4

59. The following microprocessor operations are part of interrupt cycle of a control unit :

1. MAR ← Save-address
2. PC ← Routine-address
3. MBR ← (PC)
4. Memory ← MBR

Which of the following is the correct order of their occurrence ?

- (A) 1, 2, 3      (B) 3, 4, 2  
(C) 2, 3, 4      (D) 4, 3, 1

60. Consider the following logic families :

1. RTL
2. DTL
3. TTL
4. ECL

The sequence of these logic families in the order of their decreasing Fan-Out is

- (A) 1, 2, 3, 4      (B) 2, 1, 3, 4  
(C) 4, 3, 2, 1      (D) 3, 4, 2, 1



- 61. List – I**
- a. BJT  
b. FET  
c. SCR  
d. Tunnel diode
- List – II**
- i. Pinch off effect  
ii. Controlled rectification  
iii. Negative Resistance Characteristics  
iv. Punch through effect

**Codes :**

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

- 62. List – I**
- a. Frequency modulation  
b. Double sideband suppressed signal carrier  
c. PCM  
d. Amplitude modulation
- List – II**
- i. Envelope detection  
ii. Comanding  
iii. Balance modulator  
iv. Pre-emphasis and de-emphasis

**Codes :**

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

- 63. List – I**
- a. Astable multivibrator  
b. Bistable multivibrator  
c. Monostable multivibrator  
d. Schmitt trigger
- List – II**
- i. Two-stable states  
ii. Free running oscillator  
iii. One-stable state  
iv. Square wave generator

**Codes :**

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

- 64. List – I**
- a. Gunn diode  
b. Solar cell  
c. MOSFET  
d. SCR
- List – II**
- i. Junction less device  
ii. Single junction device  
iii. Triple junction device  
iv. Double junction device

**Codes :**

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

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

**Codes :**

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

- 66. List – I**
- a. Ampere's law  
b. Biot's law  
c. Coulomb's law  
d. Gauss's law
- List – II**
- i. Force on a charge  
ii. Force due to a current carrying conductor  
iii. Electric flux density at a point  
iv. Magnetic flux density at a point

**Codes :**

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

- 67. List – I List – II**
- |                         |                  |
|-------------------------|------------------|
| a. Immediate addressing | i. LDA 30 FF     |
| b. Implied addressing   | ii. MOV A, B     |
| c. Register addressing  | iii. LXI H, 2050 |
| d. Direct addressing    | iv. RRC          |

**Codes :**

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

- 68. List – I List – II**
- |                             |   |
|-----------------------------|---|
| a. Simplex                  | i. Bidirectional at same time but not between same two points |
| b. Half Duplex (HDX)        | ii. Bidirectional and at same time between same two points    |
| c. Full Duplex (FDX)        | iii. Bidirectional but not at same time                       |
| d. Full/Full Duplex (F/FDX) | iv. Unidirectional  |

**Codes :**

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

- 69. List – I List – II**
- |                        |                                  |
|------------------------|----------------------------------|
| a. Drift current       | i. Law of Conservation of Charge |
| b. Einstein's equation | ii. Electric field               |
| c. Diffusion current   | iii. Thermal voltage             |
| d. Continuity equation | iv. Concentration gradient       |

**Codes :**

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

- 70. List – I List – II**
- |                 |                      |
|-----------------|----------------------|
| a. PN Diode     | i. Oscillator        |
| b. LED          | ii. Light emitter    |
| c. PIN Diode    | iii. Rectifier diode |
| d. Tunnel diode | iv. Light detector   |

**Codes :**

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

Read the paragraph and answer the questions to 71 – 75 :

Multiplexing is the sending of a separate signals together, over the same cable or bearer simultaneously without interference. Time division multiplex is a method of interleaving in the time domain pulses belonging to different transmissions. These pulses are generally narrow and separation between successive pulses is rather wide. That being the case it is possible, provided the two ends of a link are synchronized, to use the wide spaces for pulses belonging to other transmissions. Frequency division multiplexing concerns itself with combining continuous signals. It may be thought of as an outgrowth of independent side band transmission on a much enlarged scale. As will seen 12 or 16 channels are combined into a group, 5 groups into a subgroup. Each group and subgroup is then sent as a whole unit one microwave link cable or other broadband system. Continental broadband systems are then treated followed by coaxial cables, fibre optic cable, microwave links and troposcatter systems.

71. A scheme in which several channels are interleaved and then transmitted together is known as
- (A) frequency-division multiplex
  - (B) time-division multiplex
  - (C) a group
  - (D) a subgroup

72. Microwave link repeaters are typically 50 km apart
- (A) because of atmospheric attenuation
  - (B) because of output tube power limitations
  - (C) because of earth's curvature
  - (D) to ensure that the applied dc voltage is not excessive
73. Time-division multiplex
- (A) can be used with CPM only
  - (B) combines five group into a super group
  - (C) stacks 24 channels in adjacent frequency slots
  - (D) interleaves pulses belonging to different transmissions
74. Broad band long distance communication was originally made possible by the advent of
- (A) Geostationary satellite
  - (B) Repeater amplifier
  - (C) H.F. Radio
  - (D) Telegraph Cable
75. The number of repeaters along a co-axial cable link depends on
- (A) whether separate tubes are used for the two directions of transmission.
  - (B) the bandwidth of the system.
  - (C) the number of co-axial cables in the tube.
  - (D) the separation of equalizers.

**UGC - NET JUNE 2013****ANSWER KEYS (PAPER III)****SUBJECT : (88) Electronic Science**

<b>Q.No.</b>	<b>SC88</b>
1	D
2	A
3	D
4	B
5	A
6	D
7	C
8	D
9	C
10	A
11	A
12	D
13	D
14	C
15	B
16	B
17	B
18	C
19	C
20	A
21	B
22	D
23	C
24	A
25	B
26	B
27	C
28	A
29	B
30	D
31	A
32	B
33	D
34	C
35	D
36	A
37	A
38	D
39	B
40	C
41	C
42	B

43	A
44	B
45	A
46	A
47	A
48	A
49	C
50	B
51	C
52	C
53	D
54	B
55	C
56	D
57	B
58	B
59	A
60	C
61	C
62	D
63	D
64	B
65	D
66	B
67	A
68	A
69	B
70	C
71	A
72	C
73	D
74	B
75	B