राष्ट्रीय प्रौद्योगिकी संस्थान दिल्ली

NATIONAL INSTITUTE OF TECHNOLOGY DELHI

(शिक्षा मंत्रालय, भारत सरकार के अधीन एक स्वायत्त संस्थान)

(An autonomous Institute under the aegis of Ministry of Education (Shiksha Mantralaya), Govt. of India)

Plot No. FA7, Zone P1, GT Karnal Road, Delhi-110036, INDIA

दूरभाष/Tele: +9111-33861000, 1001, 1005, वेबसाइट/Website: www.nitdelhi.ac.in

QUESTION PAPER FOR THE POST OF TECHNICIAN (Electronics & Comm. Engg.)

(PAY LEVEL-3 , as per the 7th CPC)

Maximum Marks : 100 Time: 150 Minutes

Name of Candidate : _____

Roll No. : _____

INSTRUCTIONS TO CANDIDATES

a) The Written Examination shall consist of one paper with Part A, Part B, and Part C, carrying 100 marks in total.

b) Part A contains 20 Objective Type questions on General Knowledge, carrying 01 mark each (20 marks).

c) Part B contains 60 Objective Type questions on Domain Knowledge, carrying 01 mark each (60 marks).

d) Part C contains 05 Descriptive Type questions, each carrying 04 marks (20 marks).

e) For Objective Type questions (Part A & B), four options (A, B, C, D) shall be provided and only one correct answer is to be chosen.

f) One (01) mark shall be awarded for each correct answer in Part A and Part B.

g) Negative marking of 0.25 mark shall be applicable for each incorrect answer in Part A and Part B.

h) Unattempted questions in Part A and Part B shall not attract negative marking.

i) No negative marking shall be applicable for Part C (Descriptive questions).

j) The total duration of the Written Examination (Part A, B & C) shall be 2 hours and 30 minutes (150 minutes).

k) Candidates must write their Name, Roll Number and Signature on each page of the Question Paper / Answer Booklet.

l) Candidates must ensure that the Question Paper / Answer Booklet is complete and free from defects before the examination begins.

m) Mobile phones, electronic watches, calculators and all electronic gadgets are strictly prohibited in the examination hall.

n) Cutting, overwriting or use of correction fluid in answers is not permitted.

o) The Question Paper, Answer Sheet(s) and Admit Card must be returned to the Invigilator after completion of the examination.

p) Use of unfair means or misconduct during the examination shall lead to cancellation of candidature.

q) The decision of the Institute authorities shall be final and binding in all matters related to the examination.

r) In case of any discrepancies, the English Version of the Question shall prevail.

अभ्यर्थियों के लिए निर्देश

a) लिखित परीक्षा एक प्रश्न पत्र की होगी, जिसमें भाग-A, भाग-B तथा भाग-C सम्मिलित होंगे, तथा कुल 100 अंक होंगे।

b) भाग-A में सामान्य ज्ञान से संबंधित 20 वस्तुनिष्ठ प्रकार के प्रश्न होंगे, जिनमें प्रत्येक प्रश्न 01 अंक का होगा (कुल 20 अंक)।

c) भाग-B में विषय/डोमेन ज्ञान से संबंधित 60 वस्तुनिष्ठ प्रकार के प्रश्न होंगे, जिनमें प्रत्येक प्रश्न 01 अंक का होगा (कुल 60 अंक)।

d) भाग-C में 05 वर्णनात्मक प्रकार के प्रश्न होंगे, जिनमें प्रत्येक प्रश्न 04 अंक का होगा (कुल 20 अंक)।

e) वस्तुनिष्ठ प्रकार के प्रश्नों (भाग-A एवं भाग-B) के लिए चार विकल्प (A, B, C, D) दिए जाएंगे तथा केवल एक सही उत्तर का चयन करना होगा।

f) भाग-A एवं भाग-B में प्रत्येक सही उत्तर के लिए एक (01) अंक प्रदान किया जाएगा।

g) भाग-A एवं भाग-B में प्रत्येक गलत उत्तर के लिए 0.25 अंक की नकारात्मक अंकन किया जाएगा।

h) भाग-A एवं भाग-B में अनुत्तरित (Unattempted) प्रश्नों पर कोई नकारात्मक अंकन नहीं होगा।

i) भाग-C (वर्णनात्मक प्रश्नों) में नकारात्मक अंकन लागू नहीं होगा।

j) लिखित परीक्षा (भाग-A, भाग-B एवं भाग-C) की कुल अवधि 2 घंटे 30 मिनट (150 मिनट) होगी।

k) अभ्यर्थियों को प्रश्न पत्र / उत्तर पुस्तिका के प्रत्येक पृष्ठ पर अपना नाम, रोल नंबर एवं हस्ताक्षर करना अनिवार्य होगा।

l) अभ्यर्थियों को यह सुनिश्चित करना होगा कि प्रश्न पत्र / उत्तर पुस्तिका पूर्ण एवं किसी भी प्रकार की त्रुटि से मुक्त हो, परीक्षा प्रारंभ होने से पूर्व।

m) परीक्षा कक्ष में मोबाइल फोन, इलेक्ट्रॉनिक घड़ियाँ, कैलकुलेटर तथा सभी प्रकार के इलेक्ट्रॉनिक उपकरण सख्त रूप से वर्जित हैं।

n) उत्तरों में कटिंग, ओवरराइटिंग या करेक्शन फ्लूड का प्रयोग वर्जित है।

o) परीक्षा समाप्ति के पश्चात प्रश्न पत्र, उत्तर पत्रक(ों) तथा प्रवेश पत्र (एडमिट कार्ड) पर्यवेक्षक को वापस करना अनिवार्य होगा।

p) परीक्षा के दौरान अनुचित साधनों का प्रयोग या कदाचार पाए जाने पर अभ्यर्थी की उम्मीदवारी निरस्त कर दी जाएगी।

q) परीक्षा से संबंधित सभी मामलों में संस्थान प्राधिकरणों का निर्णय अंतिम एवं बाध्यकारी होगा।

r) किसी भी प्रकार की विसंगति की स्थिति में, प्रश्न का अंग्रेज़ी संस्करण मान्य होगा।

Part-A

Q No	Question	Answer
1	Find the next term of the given series- 8, 27, 64, ? A. 111 B. 125 C. 225 D. 99	B
2	In a group of friends, two men have wives, one is a bachelor, another's wife is dead, two are divorcees. They take four children with them to picnic. How many persons have gone to the picnic? A. 13 B. 14 C. 12 D. 10	C
3	International Labour Day is on- A. 1st May B. 2nd May C. 31st May D. 1st April	A
4	The author of world-famous Harry Potter series is- A. Arundhati Roy B. Salman Rushdie C. J. K. Rowling D. Taslima Nasrin	C
5	Statement I: Heavy rainfall was reported across the city on Monday. Statement II: Several areas in the city experienced waterlogging and traffic jams. Options: A. Statement I is the cause and Statement II is its effect. B. Statement II is the cause and Statement I is its effect. C. Both statements are independent causes. D. Both statements are unrelated.	A
6	Find out the correctly spelt word- A. Correspondence B. Corespondence C. Corrspondent D. Correspondenc	A

7	The king mocked at the servant. Select the best option which best expresses the above sentence in active/ passive voice. A. The servant was being mocked at by the king. B. The servant was mocked at by the king. C. The servant was mocked by the king. D. The servant was to be mocked by the king.	B
8	Antonym of 'Authentic'- A. Ridiculous B. Important C. Original D. Baseless	D
9	Sachin has had a <u>long inning</u> in cricket. Choose the alternative which best expresses the meaning of the idiom/ phrase- A. Fine experience B. Long spell C. Ultimate success D. Victorious win	A
10	<u>I never saw</u> you at the party yesterday. Choose the best substitution of the underlined part for sentence improvement. A. Have not seen B. Did not see C. Had never seen D. No improvement	B
11	The average weight of 16 boys in a class is 50.25 kg and that of the remaining 8 boys is 45.15 kg. Find the average weights of all the boys in the class. A. 47.55 kg B. 48 kg C. 48.55 kg D. 49.25 kg	C
12	A sum of money at simple interest amounts to Rs. 815 in 3 years and to Rs. 854 in 4 years. The sum is: A. Rs. 650 B. Rs. 690 C. Rs. 700 D. Rs. 698	D

13	A number increased by 12.5% becomes 45. What is the number? A. 36 B. 38 C. 40 D. 42	C
14	Find the smallest number by which 21296 be divided to make it a perfect cube. A. 2 B. 3 C. 4 D. 6	A
15	Which option is used to combine letters with addresses? A. Format Painter B. Mail Merge C. Track Changes D. Macro	B
16	Microsoft Excel is mainly used for: A. Word processing B. Data calculation C. Drawing D. Email sending	B
17	Which function is used to add numbers? A. COUNT() B. AVERAGE() C. SUM() D. MAX()	C
18	Shortcut key to start slide show is: A. F2 B. F5 C. F7 D. F12	B
19	Which protocol is used to browse websites? A. FTP B. SMTP C. POP D. HTTP	D
20	Dayanand Saraswati was the founder of which of the following Missions? A. Arya Samaj B. Brahmo Samaj C. Chinmay Samaj D. Prarthana Samaj	A

PART B

Sr No	Question
1	The main advantage of a digital multimeter over an analog multimeter is A) Lower cost B) No parallax error C) Lower input impedance D) Higher current capability
2	The output impedance of a standard function generator is typically A) 1Ω B) 10Ω C) 50Ω D) 1KΩ
3	The vertical deflection sensitivity of a CRO is expressed in A) Hz/div B) ms/div C) V/div D) A/div
4	In a regulated power supply, good load regulation means that the output voltage A) Increases with load current B) Decreases with load current C) Remains nearly constant with load variation D) Becomes zero at full load
5	While plotting V–I characteristics of a PN diode, why is a series resistor used in forward bias? A) To increase voltage B)To limit current C) To reduce noise D) To improve accuracy
6	Avalanche breakdown is caused by A) Tunneling B) Heavy doping C) Impact ionization D) Thermal emission

Sr No	Question
7	The wavelength of light emitted by an LED is primarily determined by A) Applied voltage B) Forward current C) Energy bandgap of semiconductor D) Junction area
8	In Zener diode voltage regulator, line regulation improves by A) Reducing series resistance B) Increasing Zener current C) Reducing load current D) None
9	For a CE amplifier, if transconductance is halved, the voltage gain becomes A) Twice B) Half C) Unchanged D) Zero
10	In CE amplifier with emitter bypass capacitor, voltage gain increases because A) Input resistance increases B) Emitter degeneration is reduced C) Collector resistance decreases D) Supply voltage increases
11	In a CE amplifier, the approximate expression for voltage gain in hparameter form is A) $-h_{fe}R_L/h_{ie}$ B) $h_{ie}/h_{fe}R_L$ C) h_{fe}/h_{ie} D) None
12	The rms output voltage of a half-wave rectifier with input Vm is A) Vm/3 B) 2Vm C) Vm D) None
13	A full-wave center-tap rectifier is fed with 50 V RMS from a transformer. Each diode has a forward drop of 0.7 V. Calculate the DC output voltage. A) 63.7 V B) 62.3 V C) 50 V D) 44 V

Sr No	Question
14	For full-wave rectifier with capacitor filter, I_{DC} = 50mA, C = 470μF, f = 50Hz. Ripple voltage is A) 4.26V B) 2.1V C) 3V D) 1V
15	A half-wave rectifier has a sinusoidal input of 50V RMS. Determine the peak inverse voltage (PIV) of the diode. A) 50V B) 70.7V C) 100V D) 141.4V
16	In a practical clipper circuit, the main factor affecting the accuracy of clipping level is A) Load resistance B) Source resistance C) Diode forward resistance and drop D) Signal frequency
17	For an ideal positive clamper with input peak Vm, the output varies between A) $-V_m$ to $+V_m$ B) 0 to +2Vm C) $-2V_m$ to 0 D) 0 to +3Vm
18	Compared to series clippers, shunt clippers generally have A) Higher output impedance B) Lower output impedance C) No effect on impedance D) Infinite impedance
19	If a DSO probe is set to 10x, the displayed voltage must be A) Divided by 10 B) Multiplied by 10 C) Left unchanged D) Squared

Sr No	Question
20	Phase difference between two signals on a DSO is calculated using A) Voltage difference B) Time difference and time period C) Sampling rate only D) Vertical sensitivity
21	Which probe setting reduces loading effect on the circuit? A) 1x B) 2x C) 5x D) 10x
22	During truth table verification of an XOR gate, output is "1" for inputs (0,0) and (1,1). This indicates the gate is behaving like A) XOR B) XNOR C) OR D) AND
23	While verifying a NOT gate, the output does not change with input variation. The most likely fault is A) Floating input B) Incorrect power supply connection C) Output shorted to ground D) All of the above
24	Which gate implementation generally provides better noise immunity? A) AND-OR B) OR-AND C) NAND-NAND D) XOR
25	Which output expression remains identical for both full adder and full subtractor? A) Carry and Borrow B) Sum and Difference C) Propagate term D) Generate term

Sr No	Question
26	Which condition ensures ZERO borrow in a full subtractor regardless of borrow-in? A) A = 0 B) B = 1 C) A = 1, B = 0 D) A ≠ B
27	A 4-bit binary number 1011 is converted into Gray code. The resulting Gray code is A) 1110 B) 1111 C) 1101 D) 1010
28	The Excess-3 code for decimal digit 7 is A) 0111 B) 1000 C) 1010 D) 1101
29	In Excess-3 code, the 9's complement of a decimal digit is obtained by A) Adding 3 B) Subtracting 3 C) Taking 2's complement of the code D) Taking 1's complement of the code
30	If a half adder is implemented using only NAND gates, minimum number of NAND gates required is A) 3 B) 4 C) 5 D) 6
31	Which statement is TRUE? A) Half subtractor requires carry-in B) Full adder cannot be cascaded C) Full subtractor handles borrow-in D) Half adder produces borrow
32	Which statement is TRUE for Excess-3 code? A) It is weighted and cyclic B) It is non-weighted and self-complementing C) It has no invalid codes D) It is error-correcting

Sr No	Question
33	A NOT operation can be realized using a NAND gate by A) Connecting both inputs together B) Grounding one input C) Leaving one input open D) Using two NAND gates in series
34	Compared to AND–OR realization, NAND–NAND realization is preferred because it A) Uses more gates B) Requires higher supply voltage C) Needs fewer ICs and interconnections D) Produces lower output voltage
35	Which set of gates is sufficient to implement any Boolean function? A) NAND only B) OR and NOT C) AND and OR D) XOR and XNOR
36	A non-inverting amplifier is preferred over an inverting amplifier when A) High gain is required B) Phase inversion is required C) Very high input impedance is required D) Output offset must be zero
37	At very high frequencies, a practical integrator behaves approximately as A) Inverting amplifier B) Adder C) Differentiator D) Voltage follower
38	An integrator uses R=50Ω and C=2μF. A DC input of 1 V is applied. Find the output slope. A) −5 V/s B) −10 V/s C) −20 V/s D) −40 V/s
39	An ideal inverting amplifier has R_f=100 kΩ and Rin=10kΩ. If the op-amp has an input offset voltage of 2 mV, the output offset voltage is approximately A) 2 mV B) 20 mV C) 200 mV D) 2 V

Sr No	Question
40	Which connector is commonly used for Ethernet networking? A) RJ11 B) RJ45 C) USB Type-C D) HDMI
41	A VGA connector has A) 15 pins in 3 rows B) 9 pins in 2 rows C) 8 pins D) 4 pins
42	Which connector is used to connect a coaxial cable to a CRO/DSO? A) RJ45 B) BNC C) HDMI D) VGA
43	In a crossover cable, which wire pairs are crossed? A) 1–2 with 7–8 B) 3–6 with 4–5 C) 1–2 with 3–6 D) 4–5 with 7–8
44	Which cable is required to connect two switches directly without using an uplink port? A) Straight-through B) Crossover C) Coaxial D) Fiber
45	A crossover cable is used to connect A) PC to Switch B) PC to Router C) PC to PC D) Switch to Router
46	To identify the IP address of a workstation on Linux, the command used is A) ipconfig B) ifconfig C) netstat D) ping

Sr No	Question
47	Which IP address cannot be assigned to a workstation? A) 192.168.1.1 B) 192.168.1.255 C) 10.0.0.50 D) 172.16.5.20
48	DHCP stands for: A) Dynamic Host Configuration Protocol B) Domain Host Control Protocol C) Direct Host Connection Protocol D) Data Host Control Program
49	Which of the following is a valid IPv4 address? A) 172.16.5.20 B) 192.168.300.1 C) 256.1.0.1 D) 10.0.0.999
50	In AM, if carrier amplitude is 10 V and the message signal amplitude is 2 V, the modulation index (m) is A) 0.2 B) 0.5 C) 0.8 D) 1.0
51	For a message signal of 5KHz and carrier 500KHz, the AM signal bandwidth is A) 5KHz B) 500KHz C) 10KHz D) 505KHz
52	MATLAB simulation: If t = 0:0.001:1, carrier = 10 cos(2π100 t), message = 2 cos(2π5 t), the AM wave can be generated using A) ammod(message, 100, 1000, carrier) B) ammod(message, 100, 1000) C) amdemod(carrier, message) D) fmmod(message, 100, 1000)

Sr No	Question
53	Which circuit is commonly used for AM demodulation in receivers? A) Balanced modulator B) Envelope detector C) Frequency discriminator D) Phase detector
54	The bandwidth of an AM signal depends mainly on the A) Carrier frequency B) Carrier amplitude C) Modulation index D) Message signal frequency
55	For correct AM modulation in MATLAB, the sampling frequency fs should be A) Equal to message frequency B) Equal to carrier frequency C) Much higher than carrier frequency D) Less than message frequency
56	If sinA+cosA=1, then sin2A =? A) 1 B) 0 C) -1 D) ½
57	If the roots of $x^2+px+q=0$ are real and equal, then A) $p^2>4q$ B) $p^2=4q$ C) $p^2<4q$ D) p=q
58	The most electronegative element is A) Oxygen B) Fluorine C) Nitrogen D) Chlorine
59	A stone is dropped from a height of 80 m. Time to reach the ground A) 4s B) 5s C) 6s D) 8s

Sr No	Question
60	A ray passes through a prism of angle 60°, minimum deviation 40°. Refractive index is A) 1.5 B) 1.6 C) 1.7 D) 1.8

Part-C

Sr No	Question
1	Explain the working principle of a digital multimeter. Why is a digital multimeter more accurate than an analog multimeter for low-voltage and high-resistance measurements?
2	Compare the VI characteristics of a Zener diode with a PN junction diode. How does Zener breakdown differ from avalanche breakdown? Include a diagram to support your explanation.
3	With the help of neat circuit diagrams, explain the working of positive series and positive parallel diode clippers. Also sketch the corresponding output waveforms.
4	Explain the generation of an Amplitude Modulated (AM) wave using a breadboard or trainer kit. How is the modulation index of an AM wave measured and calculated in the laboratory?
5	Explain the importance of laboratory log books for various equipment. What details are normally recorded in a log book? Briefly explain the relationship between equipment log books and stock registers in a laboratory.

PART B (ANSWER KEY)

1. **B**
2. **C**
3. **C**
4. **C**
5. **B**
6. **C**
7. **C**
8. **A**
9. **B**
10. **B**

11. A

12. D

13. D

14. D

15. B

16. C

17. B

18. B

19. B

20. B

21. D

22. B

23. D

24. C

25. B

26. C

27. A

28. C

29. D

30. C

31. C

32. B

33. A

34. C

35. A

36. C

37. A

38. B

39. B

40. B

41. A

42. B

43. C

44. B

45. C

46. B

47. B

48. A

49. A

50. A

51. C

52. B

53. B

54. D

55. C

56. B

57. B

58. B

59. A

60. A

राष्ट्रीय प्रौद्योगिकी संस्थान दिल्ली

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F. No.: NITD/01/Admn/606/2025-26/TEEC Dated: 11.03.2026

NOTICE

Subject: Provisional Result of the Written Test/Examination held on 11.03.2026 for the post of Technician the Department/Discipline of Electronics and Communication Engineering (01 UR), NIT Delhi, advertised vide Advt. No.: 08/2025 – reg.

S. No.	Roll No.	Form No	Part A (20 Marks)	Part B (60 Marks)	Part C (20 Marks)	Marks Obtained in written Test/Examination (100 Marks)
1.	25086014	CNDN10922	13.75	17.50	12.50	43.75
2.	25086017	CNDN11104	08.75	08.75	03.00	20.5
3.	25086020	CNDN11144	08.75	03.75	04.00	16.5
4.	25086021	CNDN11180	08.75	12.75	04.00	25.5
5.	25086024	CNDN11322	12.50	19.00	03.00	34.5
6.	25086029	CNDN11678	10.50	08.00	00	18.5
7.	25086031	CNDN11692	10.25	-3.25	04.00	11
8.	25086034	CNDN11823	06.25	07.75	02.00	16
9.	25086037	CNDN11956	11.25	01.25	04.50	17
10.	25086041	CNDN12296	15.00	40.00	14.50	69.5
11.	25086042	CNDN12307	06.75	31.25	11.50	49.5
12.	25086044	CNDN12402	08.00	10.50	04.50	23
13.	25086048	CNDN8720	13.75	18.00	06.50	38.25
14.	25086056	CNDN9729	12.50	06.25	04.50	23.25

Note:
Minimum Qualifying percentage is 60% i.e. 60 marks out of 100.

The result of the candidates who appeared for the aforementioned post is provisional in nature and may be subject to change upon receipt and examination of representations, if any, against the provisional answer key.

Further, it is hereby informed that only the candidates who are finally shortlisted, as specified at Point No. 2 under (A) of the document dated 12.12.2025, shall be called to appear for the Proficiency Test for the said post (Ref. F. No. NITD/01/Admn/606/2025–26 dated 12.12.2025).

The selection of candidates shall be subject to meeting all the eligibility criteria and successful verification of documents.

Candidates are requested to regularly visit the Institute website for further updates and notifications.

This issues with the approval of the Competent Authority.

Sd/-
(Registrar, NIT Delhi)

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F. No.: NITD/01/Admn/606/2025-26/TEEC Dated: 11.03.2026

NOTICE

Subject: Provisionally shortlisted candidate for the Proficiency Test for the post of Technician the Department/Discipline of Electronics and Communication Engineering (01 UR), NIT Delhi, advertised vide Advt. No.: 08/2025 – reg.

S. No.	Roll No.	Form No	Part A (20 Marks)	Part B (60 Marks)	Part C (20 Marks)	Marks Obtained in written Test/Examination (100 Marks)
1.	25086041	CNDN12296	15.00	40.00	14.50	69.5

Note:

The minimum qualifying percentage for the said post in the UR category is 60%, i.e., 60 marks out of 100. therefore, only 01 candidate has been provisionally shortlisted against the one (01) advertised post, as specified at Point No. 2 under (A) of the document F. No. NITD/01/Admn/606/2025–26 dated 12.12.2025.

Accordingly, the above-mentioned candidate has been provisionally shortlisted for the Proficiency Test scheduled to be held on 17.03.2026 (AN).

The above list is provisional in nature and may be subject to change upon receipt and examination of representations, if any, against the provisional answer key.

The selection of candidates shall be subject to meeting all the eligibility criteria and successful verification of documents.

Candidates are requested to regularly visit the Institute website for further updates and notifications.

This issues with the approval of the Competent Authority.

Sd/-
(Registrar, NIT Delhi)