

# CUET PG 2026 Nanoelectronics Question Paper(Memory Based)

Time Allowed :1 Hour 30 Mins	Maximum Marks :300	Total Questions :75
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## General Instructions

Read the following instructions very carefully and strictly follow them:

- The exam lasts 90 minutes (1 hour 30 minutes).
- There are 75 Multiple Choice Questions (MCQs) to be answered.
- +4 marks for every correct answer. -1 mark (negative marking) for every incorrect answer. 0 marks for unanswered or un-attempted questions.
- For any discrepancy in questions, the English version is considered final (except for language-specific papers).
- Click one of the four options to choose an answer.
- You must click "Save & Next" to confirm your response. Only saved answers are considered for evaluation.
- Use "Mark for Review & Next" to flag a question for later. You can unselect or change your answer using the "Clear Response" button.
- All calculations must be done on the Rough Sheets provided at the centre. These must be returned to the invigilator after the exam.

**1. Which allotrope of carbon is considered a one-dimensional (1D) nanostructure?**

- (A) Graphene
- (B) Carbon Nanotube
- (C) Fullerene
- (D) Diamond

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**2. How does the band gap of a semiconducting chiral carbon nanotube change as its diameter increases?**

- (A) The band gap increases
- (B) The band gap decreases
- (C) The band gap remains constant
- (D) The band gap becomes zero

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**3. What is the typical characteristic length scale range for nanomaterials?**

- (A) 1–100 nm
- (B) 1–1000 nm

- (C) 100–1000 nm
  - (D) 0.1–10 mm
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**4. In quantum mechanics, what is the degree of confinement for a Quantum Dot?**

- (A) One-dimensional confinement
  - (B) Two-dimensional confinement
  - (C) Three-dimensional confinement
  - (D) No confinement
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**5. What is the standard wavelength used in Extreme Ultraviolet (EUV) lithography?**

- (A) 248 nm
  - (B) 193 nm
  - (C) 13.5 nm
  - (D) 365 nm
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**6. Which device is a three-dimensional gate structure designed to reduce short-channel effects in nanoscale MOSFETs?**

- (A) Bipolar Junction Transistor (BJT)
  - (B) FinFET
  - (C) Diode
  - (D) Capacitor
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**7. What happens to the optical absorption spectrum of a nanoparticle as its size is reduced?**

- (A) It shifts toward longer wavelengths (red shift)
  - (B) It shifts toward shorter wavelengths (blue shift)
  - (C) It remains unchanged
  - (D) It disappears completely
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**8. In a BJT, what is the primary consequence of the Early effect on the effective base width?**

- (A) The base width increases
  - (B) The base width decreases
  - (C) The base width remains constant
  - (D) The base width becomes zero
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**9. Which type of counter requires 5 flip-flops to implement a MOD-31 operation?**

- (A) Synchronous counter
  - (B) Asynchronous (Ripple) counter
  - (C) Ring counter
  - (D) Johnson counter
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**10. For an ideal op-amp, what is the output voltage if the feedback resistance is equal to the input resistance in an inverting configuration?**

- (A)  $V_o = V_{in}$
  - (B)  $V_o = -V_{in}$
  - (C)  $V_o = 0$
  - (D)  $V_o = 2V_{in}$
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**11. Which scientist is widely regarded as the Father of Nanotechnology?**

- (A) Albert Einstein
  - (B) Richard Feynman
  - (C) Niels Bohr
  - (D) James Clerk Maxwell
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**12. What is the word length of a standard 8085 microprocessor?**

- (A) 4-bit
  - (B) 8-bit
  - (C) 16-bit
  - (D) 32-bit
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**13. In optical fibers, does the core or the cladding have a higher refractive index?**

- (A) Core
  - (B) Cladding
  - (C) Both are equal
  - (D) It varies randomly
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**14. Which property refers to the inability to repeat recorded data when scanning from different directions?**

- (A) Reproducibility
  - (B) Hysteresis
  - (C) Directional anisotropy
  - (D) Noise interference
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**15. What are the primary components of a lipid raft in the context of bio-nanoelectronics?**

- (A) DNA and RNA
  - (B) Proteins and carbohydrates
  - (C) Cholesterol and sphingolipids
  - (D) Enzymes and nucleotides
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