QUESTION BANK IN PHYSICS

LASERS

1. Name some properties, which make laser light different from ordinary light. (2) {JUN 15 [GNE]}
2. The output power of a given laser is 1mW and the emitted wavelength is 630nm. Calculate the number of photons emitted per second. If the area of laser beam is $10^{-6} m^2$, then find intensity of laser beam. (4) {JUN 15 [GNE]}
3. What is four level Laser? Hence explain theory and working of any four level laser. (4) {JUN 15 [GNE]}
4. Discuss various pumping methods used in the Lasers for obtaining population inversion. (2) {JUN 15 [PTU]}
5. Give the distinguishing features of holography from conventional photography. (4) {JUN 15 [PTU]}
6. Name four methods for pumping a laser. (2) {DEC 14 [GNE]}
7. In a Laser, the total number of lasing particles (ions, electrons, holes etc.) are $2 \cdot 8 \times 10^{19}$. If the Laser emits radiation of wavelength $7000 \overset{\circ}{A}$, then calculate the energy of one emitted photon and total energy available per pulse. Assume the efficiency of Laser to be 100%. (4) {DEC 14 [GNE]}
8. Discuss the principle of operation of He-Ne Laser. Draw the energy level diagram and indicate the wavelengths of three lasing transitions. (4) {DEC 14 [GNE]}
9. Differentiate between spontaneous and stimulated emissions. (2) {DEC 14 [PTU]}
10. Give qualitative idea of formation and reconstruction of a hologram. (4) {DEC 14 [PTU]}
11. Discuss in detail the construction, theory and working of He-Ne laser. (4) {JUN 14 [GNE]}
12. What is holography? Differentiate between holography and photography. (4) {JUN 14 [GNE]}
13. Although the efficiency of a four level laser is less than that of a three level laser, still the four level laser is better than the three level laser. Comment. (2) {JUN 14 [GNE]}
14. Calculate ratio of transition swrates of spontaneous emission to the stimulated emission for light of wavelength $10^4 m$ and cavity temperature 100K and hence determine which type of emission will dominate? (3) {JUN 14 [PTU]}
15. Specify three types of possible energy transitions between two atomic energy levels and derive conditions for Einstein's coefficients. (5) {JUN 14 [PTU]}
16. Why a three level laser normally provides pulsed output? (2) {JUN 14 [PTU]}
17. Explain the concept of optical pumping. (2) {Dec 2013 [PTU]}
18. Differentiate between three and four level lasers by taking suitable examples(s). (4) {Dec 2013 [PTU]}
19. Explain the concept and utility of holograms. (4) {Dec 2013 [PTU]}
20. Explain the role of Helium in Helium Neon laser. (2) {Dec 2013 [PTU]}

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21. What do you mean by the terms stimulated absorption, spontaneous emission and stimulated emission? (4) {Dec 2013 [PTU]}
22. Draw the energy level diagram of Helium Neon laser. Explain the operation principle of He-Ne laser. How this laser is superior to ruby laser? (4) {Dec 2013 [PTU]}
23. How holography is different from photography? (2) {Dec 2013 [GNE]}
24. What is coherence? Name its types. (2) {Dec 2013 [GNE]}
25. Derive the relationship between various Einstein's coefficients. What are the necessary conditions for the laser action to take place? (4) {Dec 2013 [GNE]}
26. Using well labeled energy level diagram, explain the working of Helium Neon laser. (4) {Dec 2013 [GNE]}
27. Explain the concept of population inversion. (2) {Jun 2013 [PTU]}
28. What are Einstein's coefficients? Discuss their significance in context of Laser operations. (5) {Jun 2013 [PTU]}
29. He-Ne Laser is superior to Ruby Laser. Comment. (3) {Jun 2013 [PTU]}
30. Specify major components of a Laser. (2) {Jun 2013 [GNE]}
31. Briefly discuss the construction and working of a helium neon laser with the energy level diagram. (4) {Jun 2013 [GNE]}
32. Discuss the basic principle of recording a hologram and write its applications. (4) {Jun 2013 [GNE]}
33. Can we obtain light amplification in the absence of stimulated emission? Explain. (2) {Dec 2012 [GNE]}
34. Determine the SI units of Einstein's coefficients A_{21}, B_{12} & B_{21}. (2) {Dec 2012 [GNE]}
35. Discuss the principle and working of He-Ne laser with the help of a diagram. (4) {Dec 2012 [GNE]}
36. What is the difference between spontaneous and stimulated emission? Explain. (4) {Dec 2012 [GNE]}
37. Are all holograms same? (2) {Dec 2012}
38. Differentiate between three level and four level lasers by giving suitable example(s). (5) {Dec 2012}
39. What is the difference between ordinary image and a hologram? (3) {Dec 2012}
40. What are the main components of a laser system? (2) {June 2012}
41. Draw the energy level diagram and discuss the working of He-Ne laser. (5) {June 2012}
42. What is the concept of Holography? (3) {June 2012}
43. How does a hologram differ from a photograph? (2) {Dec 2011}
44. Find the coherence length of white light. The wavelength of white light lies in the range 400nm to 700nm. (3) {Dec 2011}
45. Differentiate between spontaneous and stimulated emission by taking suitable examples. Which of them is applicable to laser action and why? (5) {Dec 2011}
46. Define spontaneous and stimulated emission. (2) {June 2011}
47. Differentiate between three level and four level lasers. Give the construction and working of He-Ne laser. (5) {June 2011}
48. What is Holography? (3) {June 2011}
49. What is the fundamental principle of hologram? (2) {Dec 2010}

50. Discuss with suitable diagrams, the principle, construction, working and theory of Helium Neon Laser. Explain the role of Helium atoms in this Laser. How it is superior to Ruby Laser. (6) {Dec 2010}
51. What are the differences between the terms spontaneous and stimulated emission? (2) {Dec 2010}
52. Which Laser gives output radiation having frequency in the visible and as well as IR region? (2) {June 2010}
53. Why a three level laser normally provides pulsed output? (2)
54. Specify three possible types of transitions between two atomic energy levels and derive relations between Einstein's coefficients. (5) {June 2010}
55. Calculate the ratio of rates of spontaneous emission to the stimulated emission for the light of wavelength $10^{-6} m$ and cavity temperature $T = 100K$ and hence determine which type of emission will dominate? (3) {June 2010}
56. Define LASER. (2) {Dec 2009}
57. What is the wavelength of Helium Neon Laser and Semiconductor Laser? (2) {Dec 2009}
58. Discuss the importance of doping in semiconductors. (2) {Dec 2009}
59. Explain the construction, working and energy level diagram of Ruby Laser. (5) {Dec 2009}
60. Explain the term Spatial and Temporal coherence. (3) {Dec 2009}
61. Define population inversion in Lasers. (2) {June 2009}
62. Define the process of doping in the semiconductors. (2) {June 2009}
63. What is the wavelength of light in CO_2 Laser & Ruby Laser? (2) {June 2009}
64. Explain the working, construction and energy level diagram for He-Ne Laser. (6) {June 2009}
65. What do you mean by coherence length? Write down the expression for it. (2) {Dec 2008}
66. Define Holography. (2) {Dec 2008}
67. What do you mean by spatial and temporal coherence? (2) {Dec 2008}
68. Explain the construction, working and principle of Ruby Laser. (4) {Dec 2008}
69. Define the Einstein's coefficients for Lasers and explain their significance. (4) {Dec 2008}
70. What is population inversion? How it is achieved? (2) {May 2008}
71. Why focusing of Laser Light is better than ordinary light? (2) {May 2008}
72. Explain construction and working of a Helium Neon Laser. (5) {May 2008}
73. Why we prefer four level laser over three level laser even if its efficiency is low? (3) {May 2008}
74. Write physical significance of Einstein's coefficients. (2) {Dec 2007}
75. Define Holography. (2) {Dec 2007}
76. Explain the action of He-Ne Laser. How it is superior to Ruby Laser? (4) {Dec 2007}
77. In a Ruby Laser, the total number of Cr^{+3} ions is $2 \cdot 8 \times 10^{19}$. If the Laser emits radiation of wavelength $7000 \overset{o}{A}$, then calculate the energy of one emitted photon and total energy available per pulse. (4) {Dec 2007}
78. What do you mean by spontaneous and stimulated emission? (2) {May 2007}

79. Establish the relation between Einstein's coefficients. Explain the energy level diagram for Helium Neon Laser. (8) {May 2007}
80. What is the difference between stimulated and spontaneous emission? (2) {Jan 2007}
81. Discuss the principle of operation of Helium Neon Laser. Draw the energy level diagram and indicate the wavelength of the radiation. (5) {Dec 2006}
82. Can we obtain light amplification in the absence of stimulated emission? Explain. (3) {Dec 2006}
83. Name four methods of pumping a Laser. (2) {May 2006}
84. What is the difference between spontaneous and stimulated emission? (2) {May 2006}
85. What are three level and four level lasers? Describe the construction and working of Ruby Laser. (6) {May 2006}
86. Determine the SI units of energy density $u(\omega)$, Einstein's coefficients A & B. (2) {May 2006}
87. Can we obtain amplification in the absence of stimulated emission? Explain. (2) {Dec2005}
88. What are Einstein's coefficients? How are these co-related? (2) {Dec2005}
89. Discuss the principle of operation of He-Ne laser. Draw the energy level diagram and indicate the wavelength of the radiation. (6) {Dec2005}
90. What is holography? (2) {May 2005}
91. Explain the terms spontaneous and stimulated emission. (2) {May 2005}
92. What is spontaneous and stimulated emission? (2) {Dec 2004}
93. What do you understand by Holography? Derive the relation between Einstein's coefficients. (2,6) {Dec 2004}
94. What is the difference between ordinary image and a hologram? (2) {May 2004}
95. Explain with suitable diagrams, the difference between spontaneous and stimulated emission. How will you achieve higher probability of stimulated emission? (3) {May 2004}
96. Describe the construction and working of a He-Ne Laser. (5) {May 2004}
97. What is population inversion? How is it achieved? (2) {Dec2003}

FIBRE OPTICS

1. What do you mean by splicer and connector? Give one example of each. (2) {JUN 15 [GNE]}
2. Why single mode fiber is preferred for long distance communication? (2) {JUN 15 [GNE]}
3. Define and derive expression for numerical aperture. Hence explain why numerical aperture is small for a graded index fiber in comparison to an identical step index fiber. (4) {JUN 15 [GNE]}
4. Write names of various losses taking place in the optical fiber. If the length of optical fiber is 2km and output power is 1/100 of input power, then find fiber loss and attenuation coefficient. (4) {JUN 15 [GNE]}
5. What are various signal attenuation and losses in optical fiber? (2) {JUN 15 [PTU]}

6. What is an optical fiber? Give the basic principle3 of light guidance through the optical fiber. Derive an expression for numerical aperture of an optical fiber. (6) {JUN 15 [PTU]}
7. What are splicers and couplers? (2) {JUN 15 [PTU]}
8. Why do we prefer small numerical aperture for long distance communication? (2) {DEC 14 [GNE]}
9. Differentiate single mode and multimode fiber. (2) {DEC 14 [GNE]}
10. A step index fiber with core diameter of $30\mu m$ and $n_1 = 1 \cdot 530$ and $n_2 = 1 \cdot 515$ show absorption of 0.0002% of incident power at each reflection on the core-clad boundary. Find the attenuation in dB/km for a ray suffering 10^6 reflections in a fiber length of 1km. Assume that there are no other losses. (4) {DEC 14 [GNE]}
11. What do you mean by pulse dispersion? Discuss its various types and its role in the functioning of optical fiber. (4) {DEC 14 [GNE]}
12. What is the basic principle of guiding light through an optical fiber? (2) {DEC 14 [PTU]}
13. What are different kinds of optical fibers? Discuss various kinds of dispersions produced when light propagates through optical fiber. (5) {DEC 14 [PTU]}
14. Give three applications of optical fibers. (3) {DEC 14 [PTU]}
15. Define acceptance angle and numerical aperture and hence derive mathematical relation between the two. (4) {JUN 14 [GNE]}
16. The core of a glass fiber has refractive index $1 \cdot 5$, while its cladding is doped to give a fractional change in refractive index equal to $0 \cdot 005$. Find (i) refractive index of clad (ii) critical internal reflecting angle (iii) acceptance angle and (iv) numerical aperture. (4) {JUN 14 [GNE]}
17. Why data carrying capacity of optical fiber is more than that of radio waves? (2) {JUN 14 [GNE]}
18. A step index fiber with refractive index of core 1.458 and numerical aperture 0.3 is to be used at 850nm. Find the core radius if the normalized frequency is 75. (3) {JUN 14 [PTU]}
19. Describe construction of optical fiber with the help of diagram. Further describe different factors responsible for loss of signal propagating through optical fiber. (5) {JUN 14 [PTU]}
20. What do you understand by $10 \cdot 5 dB/km @ 850 nm$? (2) {JUN 14 [PTU]}
21. A glass fiber has a core material of refractive index $1 \cdot 46$ and cladding material has a refractive index of $1 \cdot 42$. If it is surrounded by air, compute the critical angle (i) at core cladding boundary (ii) at cladding air boundary. (4) {Dec 2013 [PTU]}
22. Discuss merits and demerits of single mode optical fibers. (4) {Dec 2013 [PTU]}
23. What do you mean by index profile of optical fiber? (2) {Dec 2013 [PTU]}
24. What is meant by modes? Compare a single mode and multimode fiber. (4) {Dec 2013 [PTU]}
25. An optical fiber has a numerical aperture of $0 \cdot 20$ and cladding refractive index of $1 \cdot 59$. Determine the acceptance angle for the fiber in water, which has a refractive index of $1 \cdot 33$. (4) {Dec 2013 [PTU]}
26. Find the numerical aperture of an optical fiber, whose core and clad have refractive index respectively $1 \cdot 46 \& 1 \cdot 45$. (2) {Dec 2013 [GNE]}

27. Define acceptance angle and derive mathematical relation for it. (4) {Dec 2013 [GNE]}
28. Find the core radius necessary for SMF for propagation wavelength of 850nm and core and clad refractive index respectively as $1 \cdot 50 \& 1 \cdot 49$. (4) $1 \cdot 46 \& 1 \cdot 45$
29. What do you mean by fiber optic cable splicing? (2) {Jun 2013 [PTU]}
30. A step index fiber with core diameter of $30\mu m$ and $n_1 = 1 \cdot 530$ and $n_2 = 1 \cdot 515$ show absorption of $0 \cdot 00002\%$ of the incident power at each reflection at the core boundary. Find the attenuation in dB/km for such a fiber for a ray entering just below the acceptance angle. Assume that there are no other losses. (4) {Jun 2013 [PTU]}
31. Elaborate the concept of material dispersion. (4) {Jun 2013 [PTU]}
32. Specify an application where Laser and optical fiber are used together. (2) {Jun 2013 [GNE]}
33. What do you mean by acceptance cone for an optical fiber? (2) {Jun 2013 [GNE]}
34. A step index fiber with refractive index of $1 \cdot 458$ and numerical aperture of $0 \cdot 3$ is to be used at 820nm. Find the core radius if the normalized frequency is 75. (3) {Jun 2013 [GNE]}
35. What do you mean by intramodal and intermodal dispersion in optical fiber? What are its effects in signal transmission through optical fiber? (5) {Jun 2013 [GNE]}
36. What are splicers and couplers? (2) {Dec 2012 [GNE]}
37. What is the principle of optical fibre? Discuss various applications of optical fibres. (4) {Dec 2012 [GNE]}
38. Calculate the numerical aperture and acceptance of an optical fibre with $n_1 = 1 \cdot 50 \& n_2 = 1 \cdot 45$. (4) {Dec 2012 [GNE]}
39. Give the main advantages of fibre communication. (2) {Dec 2012}
40. The core of a glass fibre has a refractive index of $1 \cdot 6$ while its clad is doped to give a fractional change in refractive index of $0 \cdot 008$ find the refractive index of the cladding and the critical internal refracting angle. (4) {Dec 2012}
41. Elaborate important characteristics of step index fibres. (4) {Dec 2012}
42. Find the core radius necessary for the single mode operation at 800nm in step index fibre with $n_1 = 1 \cdot 48 \& n_2 = 1 \cdot 47$. Also find the numerical aperture and maximum acceptance angle. (5) {June 2012}
43. What do you understand by Material Dispersion? (3) {June 2012}
44. Give important applications of optical fibres. (2) {Dec 2011}
45. A 20km long fibre cable has a loss of $2 dBkm^{-1}$ and a connector loss of $0.06 dBkm^{-1}$. Find the total loss. (3) {Dec 2011}
46. Derive an expression for pulse broadening due to intermodal dispersion in multimode step index fibre. (5) {Dec 2011}
47. Explain the term mode related to optical fibre. (2) {June 2011}
48. A fibre is made with core of refractive index $1 \cdot 5$ and the cladding is dopped to give a refractive index difference of $0 \cdot 0005$. Find (i) the cladding refractive index (ii) the critical angle (iii) acceptance angle and (iv) numerical aperture. (4) {June 2011}

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49. Describe the role of fibre connectors, splicers and couplers in communication through fibres. (4) {June 2011}
50. What do you understand by single mode and Multimode fibre? (2) {Dec 2010}
51. Explain the difference between a step index and a graded index fibre. (3) {Dec 2010}
52. What is mean by acceptance angle for an optical fibre? Show how it is related to numerical aperture. (5) {Dec 2010}
53. What do you understand by "$10 \cdot 5 dB/km @ 850 nm$? (2) {June 2010}
54. Describe the construction of an optical fibre with the help of suitable diagram. Further describe different factors responsible for loss of signal propagating through a fibre. (4) {June 2010}
55. Calculate the numerical aperture, acceptance angle and critical angle of a fibre having core refractive index $1 \cdot 5$ and cladding refractive index $1 \cdot 45$. (4) {June 2010}
56. What is the significance of V-number in OFC's? (2) {Dec 2009}
57. Differentiate between Step index and Graded index optical fibre. (4) {Dec 2009}
58. Calculate the numerical aperture, acceptance angle and critical angle of a fibre having core refractive index $1 \cdot 5$ and cladding refractive index $1 \cdot 45$. (4) {Dec 2009}
59. Define NA (Numerical Aperture) and Acceptance Angle. (2) {June 2009}
60. Calculate the expression for NA for OFCs (Optical Fibre Cables). (4) {June 2009}
61. A step index fibre has a normalized frequency $= 26 \cdot 6$ at 1300nm wavelength. If the core is $50 \mu m$ thick, calculate the acceptance angle of the fibre. (4) {June 2009}
62. Define bending losses in OFCs. (2) {Dec 2008}
63. What are the advantages of the optical fibres in communication systems? (2) {May 2008}
64. What are various kinds of optical fibres? Explain different mechanisms of dispersion in fibres. (5) {May 2008}
65. Light gathering capacity of an optical fibre is $0 \cdot 479$. If relative core cladding index difference is $0 \cdot 005$, calculate the refractive index of cladding if the outside medium is air. (4) {Dec 2008}
66. What is splicing? Define its types. Explain optical couplers. (4) {Dec 2008}
67. An optical fibre has NA of $0 \cdot 15$ and cladding refractive index is equal to $1 \cdot 5$. Find the numerical aperture of the fibre in a liquid of refractive index $1 \cdot 3$. Also find the refractive index of the core. (3) {May 2008}
68. Define acceptance angle and numerical aperture in optical fibre. (2) {Dec 2007}
69. Differentiate between step index and graded index fibre. (4) {Dec 2007}
70. What will be the critical angle and acceptance angle for a ray in a step index fibre for which $n_1 = 1 \cdot 53$ and which has cladding whose refractive index is $2 \cdot 5\%$ less than that of core. (4) {Dec 2007}
71. Distinguish between step index and graded index fibre. (2) {May 2007}
72. What is optical fibre cable? Explain the basic theory of propagation of light in the optical fibre. (4) {May 2007}

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73. An optical fibre has numerical aperture of $0 \cdot 20$ and cladding of refractive index $1 \cdot 59$. Determine the acceptance angle for the fibre in water which has refractive index $1 \cdot 33$. (4) {May 2007}
74. What are the factors, which affect the propagation of light through an optical fibre? (2) {Dec 2006}
75. What do you mean by Pulse dispersion in step index fibre? How is graded index fibre useful in reducing the pulse dispersion? (5) {Dec 2006}
76. Calculate the numerical aperture and acceptance angle of an optical fibre. Given that the refractive index of the core and cladding are $1 \cdot 45 \& 1.40$ respectively. (3) {Dec 2006}
77. Why the information carrying capacity of optical fibre is very much greater than the conventional radiowaves and microwaves? (2) {May 2006}
78. What is numerical aperture? Explain material dispersion and pulse dispersion and pulse dispersion in optical fiber. (6) {May 2006}
79. What are splicers and couplers? (2) {May 2006}
80. Define acceptance angle and numerical aperture. (2) {Dec2005}
81. What is the difference between single mode and multimode transmission in optical fibres? (4) {Dec2005}
82. Calculate the maximum value of angle of incidence that a ray can make with the axis of the fibre such that it is guided through the fibre for the following fibre parameters: (i) $n_1 = 1 \cdot 6, \mathrm{n}_2 = 1 \cdot 5$ (ii) $n_1 = 2 \cdot 1, \mathrm{n}_2 = 1 \cdot 5$. (4) {Dec2005}
83. What is total internal reflection? (2) {May 2005}
84. What is numerical aperture? Calculate the numerical aperture and hence the acceptance angle for optical fibre, given that the refractive indices of the core and cladding are $1 \cdot 45 \& 1 \cdot 40$ respectively. (2,6) {May 2005}
85. What is numerical aperture? (2) {Dec 2004}
86. What is total internal reflection? Calculate the numerical aperture and hence the acceptance angle for an optical fibre. Given that refractive indices of the core and the cladding are $1 \cdot 45 \& 1 \cdot 40$ respectively. (3,5) {Dec 2004}
87. Distinguish between step index and graded index optical fibre. (2) {May 2004}
88. Discuss the propagation of light through a step index multimode fibre. Explain the meaning of acceptance angle and numerical aperture. Also derive expressions for these. (6) {May 2004}
89. The core of a glass fibre has refractive index $1 \cdot 5$, while its cladding is doped to give a fractional change in refractive index of $0 \cdot 005$. Find (i) refractive index of cladding (ii) critical internal reflecting angle (iii) acceptance angle (iv) numerical aperture (2)
90. What do you understand by the term acceptance cone for an optical fibre? (2) {Dec2003}

NANOPHYSICS

1. Why storage of nanomaterials is a challenge? (2) {JUN 15 [GNE]}
2. Write short notes on (i) Quantum confinement (ii) Carbon nanotubes (CNTs). (2) {JUN 15 [GNE]}
3. Write major applications and disadvantages of nanotechnology. (2) {JUN - 15[GNE]}

4. Define nanoscience and nanotechnology. (2) {JUN 15 [PTU]}
5. Discuss various techniques for synthesis of nanomaterials. (5) {JUN 15 [PTU]}
6. Write short note on carbon nanotubes. (3) {JUN 15 [PTU]}
7. Write four disadvantages of nanotechnology. (2) {DEC 14 [GNE]}
8. How can we synthesize nanomaterials? Explain various steps involved in Sol-Gel technique. (4) {DEC 14 [GNE]}
9. Name and explain two important factors responsible for distinguished properties of nanomaterials. (4) {DEC 14 [GNE]}
10. Give a brief and broad outline of sol-gel synthesis of nanomaterials. (2) {DEC 14 [PTU]}
11. Discuss various techniques of synthesis of nanomaterials. (5) {DEC 14 [PTU]}
12. Write short note on carbon nanotubes. (3) {DEC 14 [PTU]}
13. Explain optical and magnetic properties of nano materials. (4) {JUN 14 [GNE]}
14. Discuss in detail sol-gel technique for synthesis of nano-materials. (4) {JUN 14 [GNE]}
15. Write any two properties of carbon nanotubes. (2) {JUN 14 [GNE]}
16. Discuss briefly different methods used to synthesize the nanoparticles. (4) {JUN 14 [PTU]}
17. Give two properties of carbon nanotubes. (2) {JUN 14 [PTU]}
18. Differentiate between nanowire and nanotune. (2) {Dec 2013 [PTU]}
19. Justify that surface area to volume ratio increases while we go from bulk to nano scale. (4) {Dec 2013 [PTU]}
20. Demonstrate the composition of fullerene C_{60} structure and discuss its real world application(s). (4) {Dec 2013 [PTU]}
21. Give examples of one, two and three dimensional nanomaterials. (2) {Dec 2013 [GNE]}
22. How can nanomaterials be synthesized? Explain any technique in detail by giving its advantages and disadvantages. (4) {Dec 2013 [GNE]}
23. Write applications and potential risks of nanomaterials. (4) {Dec 2013 [GNE]}
24. What is electron confinement? (2) {Jun 2013 [PTU]}
25. "Surface area to volume ratio gets enhanced at nano scale." Comment. (4) {Jun 2013 [PTU]}
26. Discuss some applications of carbon nanotubes. (4) {Jun 2013 [PTU]}
27. Write two peculiar features which distinguish nano materials from normal materials. (2) {Jun 2013 [GNE]}
28. Discuss briefly different methods for synthesis of nanomaterials. (4) {Jun 2013 [GNE]}
29. What do you understand carbon nanotubes? How are these synthesized? (4) {Jun 2013 [GNE]}
30. What are nanomaterials? Explain. (2) {Dec 2012 [GNE]}
31. How can we synthesis nanomaterials? Explain Sol-Gel technique in details. (4) {Dec 2012 [GNE]}
32. What are carbon nanotubes? Discuss various applications of nanomaterials. (4) {Dec 2012 [GNE]}
33. What is quantum dot? (2) {Dec 2012}

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34. Elaborate the concept of particle confinement in context of nanophysics. (4) {Dec 2012}
35. Elaborate the advantages of using Sol-Gel process for synthesizing nanomaterials. (4) {Dec 2012}
36. What is Nanophysics? (2) {June 2012}
37. What are advantages of synthesizing nanomaterials? (4) {June 2012}
38. Synthesis of nanotubes is a challenge. Comment. (4) {June 2012}
39. What are nano materials? (2) {Dec 2011}
40. What is Quantum confinement? (2) {Dec 2011}
41. What are advantages of synthesizing nano materials using Sol-Gel method? (4) {Dec 2011}
42. Advocate the utility of fullerene structure in reference to the synthesis of nanotubes. (4) {Dec 2011}

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