NITTE (Deemed to be University) | NMAM INSTITUTE OF TECHNOLOGY

# BIOLOGY FOR ENGINEERS (BT1651-1)
## Unit 2-QUESTION BANK (Topic 6-10)

| Q. N | Topic 6: Composites in Construction, Termite Mound Architecture | Option A (correct Ans) | Option B | Option C | Option D |
|---|---|---|---|---|---|
| 1. | Composites are | Two or more constituent materials | Materials with similar chemical properties | Materials with similar physical properties | Only one material with different shapes, colours |
| 2. | This is not a beneficial aspect of composites | Heavy weight | Corrosion resistance | High durability | Design flexibility |
| 3. | Composites are used | All the fields mentioned | Only in constructions | Only in medical applications | Only in transportation |
| 4. | Composite materials are used in construction due to | Better than traditional building materials | Heavy weight | Different shapes available | Different colours available |
| 5. | FRP composites are created using | Plastic Polymer Resin | Glass Polymer Resin | Ceramic Polymer Resin | Metal Polymer Resin |
| 6. | FRP composites are created through the combination of a plastic polymer resin with strong | Fibers | Glass | Metal | Ceramic |
| 7. | Bio-composites are fabricated by combining _____in a matrix material. | Natural fibers | Natural rubber | Synthetic fibres | Synthetic rubber |
| 8. | This is an example of a natural bio composite | Wood | Rubber | Cotton | Jute |

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| 9. | Naturals fibers are abundant and have | Low harvesting costs | High harvesting costs | Low growth rate | High growth rate |
| 10. | Synthetic fibers have | Recycling issues | Production issues | Transport issues | Raw material issues |
| 11. | Synthetic fibers generates | Toxic byproducts | Non toxic byproducts | No byproducts | Neutral byproducts |
| 12. | Biocomposites are made using | Reinforcement and matrice | Reinforcement and filler | Matrice and thermosets | Matrice and polymers |
| 13. | This is not a natural fiber | Isocyanate | Cotton | Hemp | Flax |
| 14. | Hybrid biocomposites are derived by | Fibers and matrix blending | Only fiber blending | Only matrix blending | Only polymer blending |
| 15. | This is not expected in case of biocomposites | Rottening | Light weight | Recyclability | Local production |
| 16. | The termite mounds sometimes have a diameter of _____metres | 30 | 40 | 50 | 60 |
| 17. | The termites will not use this for mound construction | Wood | Soil | Saliva | Dung |
| 18. | Although the termite mound appears solid, the structure is incredibly | Porous | Non porous | Wet | Hot |
| 19. | The termite mounds are often occupied by | Snakes | Rats | Frogs | Bats |
| 20. | Termites mound chimneys use sunlight to heat and cool the structure and ventilate____ | Oxygen | Nitrogen | Carbon dioxide | Hydrogen |

| **Q. N** | **Topic 7: Counter Current Heat Exchangers** | **Option A (correct Ans)** | **Option B** | **Option C** | **Option D** |
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| 21. | Heat exchangers are devices designed to transfer heat between two or more | All of these | Vapors | Gases | liquids |

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| 22. | The heat transferring process in heat exchangers occurs through which separator | Solid | Liquid | Gas | vapour |
| 23. | Which prevents the mixing of the fluids or direct fluid contact in heat exchangers | Solid separator | Liquid separator | Gas separator | vapour separator |
| 24. | In a heat exchanger, two fluids (hot and cold) flow in opposite directions. The type of fluid flow is: | Counter current | Co-current | Cross current | Parallel current |
| 25. | Heat exchangers prevents vehicle engines | Overheat | Overspeed | Overcharge | Overcool |
| 26. | In large fish and aquatic mammals core body temperature is maintained constant by | Counter current heat exchange | Concurrent heat exchange | Net current exchange | Anit current Exchange |
| 27. | The tuna fish has core body temperature as like | Mammals | Reptiles | Insects | Worms |
| 28. | The tuna fish was often called as | Warm blooded fish | Cold blooded fish | Slow moving fish | Tiny fish |
| 29. | Tuna fish while swims, higher amount of heat is generated in the core of the body due to | Muscle action | Nerve action | Backbone action | blood vessel action |
| 30. | The core body temperature of an animal may rise even up to_____degree celsius, while it is running? | 42 | 82 | 62 | 72 |

| **Q. N** | **Topic 8: Design of Aeroplane, Helicopter and Submarine** | **Option A (correct Ans)** | **Option B** | **Option C** | **Option D** |
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| 31. | Who drew the first aircraft design art? | Leonardo da vinci | Donatello | Michelangelo | Raphael |
| 32. | The aircraft design art drawn during, 14th century was named as_____ | Helical air screw | Eliptical air screw | Rounded air screw | Axial air screw |
| 33. | The wright brothers' first flight name is_____ | Flyer 1 | Trailer 1 | Arial 1 | Helical 1 |

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| 34. | By observing the birds flying mechanism, the wright brothers are able to control their airplane by | Wing warping method | Wing wrapping method | Wing folding method | Wing stretching method |
| 35. | The contour of bird wing design shows | Minimum resistance for wind | Maximum resistance for wind | No resistance for wind | Threshold resistance for wind |
| 36. | The aspect ratio in the wing design is | Length to width | Width to length | Length to thickness | Width to thickness |
| 37. | In the birds wing the aspect ratio varies from | 1.5-18 | 1.5-1.8 | 15-18 | 150-180 |
| 38. | As the aspect ratio increases in the wing design, the flight adaptability is | Better | Worse | No change | Cannot be determined |
| 39. | When air moves over the wing, the air pressure above the wing | Decreases | Increases | Remains same | Cannot be determined |
| 40. | When air moves over the wing, the air pressure below the wing | Increases | Decreases | Remains same | Cannot be determined |
| 41. | The blades at the hind edge of the wings of an air plane are withdrawn while on | Gliding | Landing | Take off | On runway |
| 42. | In the airplane, wing blades at the hind edge are extended and thrusted downward while | Landing | Take off | Gliding | On runway |
| 43. | A bird can change its wing shape by the help of | Feathers | Legs | Knees | Beaks |
| 44. | The inventor of modern helicopter | Igor sikorsky | Louis-charles | Jacques breguet | Wright brothers |
| 45. | The helicopter analogy is with this living creature | Dragonfly | Butterfly | Honey bee | birds |
| 46. | How many sets of wings the dragon fly consists? | Two | Three | Four | One |

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| 47. | Which part serves to stabilize the helicopter during its flight? | Tail rotor | Rotor mast | Rotor blades | Tail boom |
| 48. | Helicopter changes course by altering angle of attack by the help of | Mechanical levers | Electrical cables | Landing skids | Cockpits |
| 49. | During generation of bernoulli lift, the air moves _____ over the top of the wing compared to the bottom | Faster | slower | In the opposite direction | In the same speed |
| 50. | The high lift devices and control surfaces of airplane perform similar functions to which organ of birds? | Wings | Legs | Neck | Bill |
| 51. | When dragon flies moves forward, what provides them the propulsion? | Rear wings | Front wings | Tail | Legs |
| 52. | When the dragonfly moves forward, the front set of wings gives the dragonfly | Lift | Propulsion | Pressure | Rotation |
| 53. | Absence of what causes the helicopter to rotate about it's own axis | Tail rotor | Rotor blades | Wing sections | Mechanical levers |
| 54. | The dragonfly wings and the helicopter blades are designed in such a way that | Air flows faster through the upper region of the wings | Air flows slower through the upper region of the wings | Air flows faster through the lower region of the wings | Air flows slower through the lower region of the wings |
| 55. | Dragonfly adjusts the angle of attack on it's wings by | Transitioning it's muscle to beats it's wings slightly different pattern | By rotating about its own axis | Fluttering the wings whilst flight | By changing it's mass |
| 56. | Blades of helicopter are made up of composite materials to prevent | Cracking of blades under stress | Altering of angle of attack | Lift and propulsion | Upward suction effect |

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| 57. | The air flow below the rotor blades is slower resulting in high pressure so total effect is that the helicopter is | Pushed upwards | Pushed downwards | Pulled upwards | Pulled downwards |
| 58. | The civilian submarines are used for marine and freshwater research projects which is called as | Oceanography | Windography | Hydrography | Marinography |
| 59. | The whale body contour almost resembles to | Submarine | Airplane | Helicopter | Cruise ship |
| 60. | The major similarity between whale body and submarine is _____. | Shape of body | Colour | Capacity | Speed |

| Q. N | Topic 9 : Information theory and biology, Sonar – Echolocation | Option A (correct Ans) | Option B | Option C | Option D |
|---|---|---|---|---|---|
| 61. | Who proposed the information theory in communication industry? | Shannon | Feynman | Adleman | Watson |
| 62. | DNA backbone, outside the double helix is made up of | Phosphate and sugar | Sugar and nitrogen | Nitrogen and carbon | Phosphate and nitrogen |
| 63. | Which of the following statement is true related to DNA | The two DNA strands are anti-parallel and complementary | The two DNA strands are parallel and complementary | The two DNA strands are parallel and non-complementary | The two DNA strands are anti parallel and non-complementary |
| 64. | This is the purine nitrogenous base of DNA | Guanine | Thymine | Cytosine | Uracil |
| 65. | This is not the pyrimidine nitrogenous base | Adenine | Uracil | Cytosine | Thymine |
| 66. | The idea of individual molecules could be used for computation was proposed by | Feynman | Shannon | Adleman | Watson |
| 67. | The concept of DNA computing was introduced by | Adleman | Shannon | Feynman | Watson |

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| 68. | Dr. Adleman has written an article on solving HDP problem. Here HDP problem stands for | Hamiltonian directed path problem | Highly directed path problem | Halwart directional path problem | Holts directional path problem |
| 69. | Adleman put his theory of DNA computing to the test on a problem called the | Traveling Salesman Problem (TSP) | Tool salesman Problem (TSP) | Ribo Computing Problem (RCP) | Machine Executing Problem (MEP) |
| 70. | Which is the limitation of DNA computing? | Time consuming laboratory procedures | Extremely dense information storage | Enormous parallel computing possibilities | Extraordinary energy efficiency |
| 71. | The science of using computational tools and systems to answer problems of biology is | Bioinformatics | Synthetic Biology | Computational Biology | Evolutionary Biology |
| 72. | Developing theories, algorithms and statistical models to analyze biological data is | Computational Biology | Synthetic Biology | Bioinformatics | Evolutionary Biology |
| 73. | Disadvantage of DNA strands for computing is | DNA is organic and decays. Experimentation thus must not be time consuming. | The two strands are complimentary. Hence is unique. | The four base pairs AGCT with triplet codes store enormous information. | Complementary strands give low scope for error. |
| 74. | This is not the hidden factors affecting complexity of DNA computers | Complementarities of DNA makes it unique for error corrections | Arbitrary number of test tubes to be used for experiments | Unrealistic assessment of how reactant concentrations scale with problem size | DNA, in vitro (in the lab) decays |
| 75. | The powerful computing power of DNA computers can be used in future for_____ | All of these | Genetic programming | Language systems | Data Encryption |
| 76. | What is SONAR? | Sound Navigation And Ranging | Solar Navigation And Response | Sound Navigation And Response | Solar Navigation And Ranging |
| 77. | Which among the following is widely used submarine applications | SONAR | RADAR | LIDAR | Electromagnetic waves |

| | | | | | |
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| 78. | Which creatures use sound waves to locate objects _____ | Bats | Butterflies | Dragonflies | Eagles |
| 79. | Bats sense their direction through_____ | Echolocation | Sense of sight | Wings | Nose |
| 80. | Along with the position information, bats can also discriminate objects based on | All of these | Shape | Size | Texture |
| **Q. N** | **Topic 10 :Medical Devices- Artificial pacemaker, Bionic eye, Cochlear implant** | **Option A (correct Ans)** | **Option B** | **Option C** | **Option D** |
| 81. | A pacemaker system consists of | Pulse generator, leads | Expansion generator, leads | Atrium blocker, leads | Ventricle blocker, leads |
| 82. | The name given to the condition in which the electrical impulses may be blocked along the pathway through the heart_____ | Heart block | Heart attack | Heart impulse | Heart Clog |
| 83. | A single-chamber pacemaker paces _____ | Right/left atrium or right/left ventricle | Left atrium only | Right atrium only | Right ventricle only |
| 84. | The weight /mass of the pacemaker is about _____ | 22-50 gms | 2.2-5 gms | 220-500 gms | 0.22-0.5 gms |
| 85. | The Dual-chamber pacemaker senses _____ | Both atrial and ventricular activity | Only right atrial activity | Only left ventricular activity | Only right ventricle activity |
| 86. | The Biventricular-chamber pacemaker paces _____ | Right/left atrium and both right/left ventricle | Left atrium only | Right ventricle only | Left ventricle only |
| 87. | In which type of pacemaker the patient body serves as the grounding source | Unipolar | Bipolar | Multipolar | Non-polar |
| 88. | In which type of pacemaker there is less chance for electromagnetic interference | Bipolar | Unipolar | Multipolar | Non-polar |
| 89. | The insulated wire that carries the stimulus from a pulse generator to the heart in an artificial pace-maker is called? | Lead | Pacer | Generator | Pulsar |

| | | | | | |
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| 90. | Leads in an Artificial Pacemakers are wires threaded through _____ and attached to the heart muscles carrying impulses | Veins | Arteries | Aorta | Venacava |
| 91. | The Bionic eye provokes visual sensations in the brain by directly stimulating different parts of | Optic nerve | Cornea | Eye lid | Eye lens |
| 92. | Age related loss of central vision and blurred peripheral vision is | Macular degeneration | Glaucoma | Retinopathy | Cataract |
| 93. | The genetic eye disease, where loss of peripheral vision occurs | Retinitis Pigmentosa | Glaucoma | Retinopathy | Macular degeneration |
| 94. | The two medical conditions of eye that bionic eye aims to address are | Macular degeneration and Retinitis Pigmentosa | Retinitis Pigmentosa and Retinopathy | Glaucoma and Cataract | Macular degeneration and Retinopathy |
| 95. | Cochlear implant captures sound and turns it into digital code with the help of: | Sound processor | Stimulator | Transmitter | Microphone |
| 96. | The cochlear technology is to help people who | All of these | Who have moderate hearing loss in both of ears | Who has little or no benefit from hearing aid | Who has 50% or less or sentence recognition test score |
| 97. | This is worn behind the ear or on the body, captures sound and turns it into digital code | Sound processor | Battery | Transmitting coil | Electrode array |
| 98. | Choose the correct answer for which the benefits of a cochlear implant for hearing impaired person is not true | Cannot focus better when in noisy environment | Feel safer | Reconnect with missed sounds | Hear well |
| 99. | Since 1972 more than _____ different cochlear implants have been done. | 16 | 17 | 18 | 19 |
| 100 | The hearing aids in the ear | Makes sound louder | Makes sound smoother | Makes sound silent | Makes sound noiseless |

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