

CET (PG)-2015

Sr. No. : 213088

Question Booklet Series : A

Important: Please consult your Admit Card / Roll No. Slip before filling your Roll Number on the Test Booklet and Answer Sheet.

Roll No. *In Figures* *In Words*

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O.M.R. Answer Sheet Serial No.

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Signature of the Candidate : _____

Subject : M.Tech. (Nano Science and Nano Tech.)

Time : 90 minutes

Number of Questions : 75

Maximum Marks : 75

DO NOT OPEN THE SEAL ON THE BOOKLET UNTIL ASKED TO DO SO

INSTRUCTIONS

1. Write your Roll No. on the Question Booklet and also on the OMR Answer Sheet in the space provided and nowhere else.
2. Enter the Subject and Series Code of Question Booklet on the OMR Answer Sheet. Darken the corresponding bubbles with **Black Ball Point / Black Gel pen.**
3. Do not make any identification mark on the Answer Sheet or Question Booklet.
4. To open the Question Booklet remove the paper seal gently when asked to do so.
5. Please check that this Question Booklet contains **75** questions. In case of any discrepancy, inform the Assistant Superintendent within 10 minutes of the start of test.
6. Each question has four alternative answers (A, B, C, D) of which only one is correct. For each question darken only one bubble (A or B or C or D), whichever you think is the correct answer, on the Answer Sheet with **Black Ball Point / Black Gel pen.**
7. If you do not want to answer a question, leave all the bubbles corresponding to that question blank in the Answer Sheet. No marks will be deducted in such cases.
8. Darken the bubbles in the OMR Answer Sheet according to the Serial No. of the questions given in the Question Booklet.
9. Negative marking will be adopted for evaluation i.e., 1/4th of the marks of the question will be deducted for each wrong answer. A wrong answer means incorrect answer or wrong filling of bubble.
10. For calculations, use of simple log tables is permitted. Borrowing of log tables and any other material is not allowed.
11. For rough work only the sheets marked "Rough Work" at the end of the Question Booklet be used.
12. The Answer Sheet is designed for **computer evaluation**. Therefore, if you do not follow the instructions given on the Answer Sheet, it may make evaluation by the computer difficult. **Any resultant loss to the candidate on the above account, i.e., not following the instructions completely, shall be of the candidate only.**
13. After the test, hand over the Question Booklet and the Answer Sheet to the Assistant Superintendent on duty.
14. In no case the Answer Sheet, the Question Booklet, or its part or any material copied/noted from this Booklet is to be taken out of the examination hall. Any candidate found doing so, would be expelled from the examination.
15. A candidate who creates disturbance of any kind or changes his/her seat or is found in possession of any paper possibly of any assistance or found giving or receiving assistance or found using any other unfair means during the examination will be expelled from the examination by the Centre Superintendent/Observer whose decision shall be final.
16. **Telecommunication equipment such as pager, cellular phone, wireless, scanner, etc., is not permitted inside the examination hall. Use of calculator is not allowed.**

SEAL

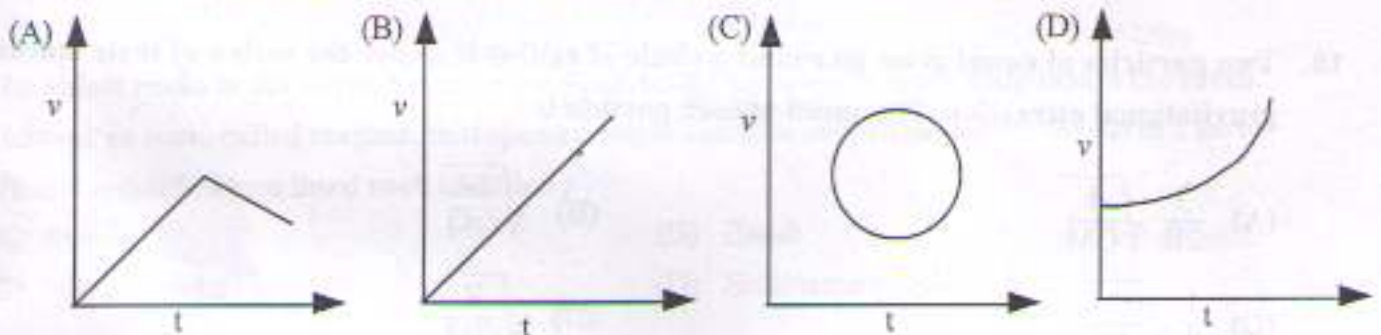
1. What is full form of CMOS ?

- (A) Content Metal Oxide Semiconductor
 (B) Complementary Metal Oxide Semiconductor
 (C) Complementary Metal Oxygen Semiconductor
 (D) Complementary Metal Oscillator Semiconductor

2. Pinus belongs to the class :

- (A) Gentopsida
 (B) Cycadopsida
 (C) Coniferopsida
 (D) Sphenopsida

3. Which of the following curves do not represent motion in one dimension ?



4. A bend in a level road has a radius of 100 m. Find the maximum speed which a car turning this bend may have without skidding. If the coefficient of friction between the tyres and the road is 0.8 :

- (A) 28 m/s
 (B) 40 m/s
 (C) 80 m/s
 (D) 32 m/s

5. What is the name of first super computer of India ?

- (A) Saga 220
 (B) PARAM 8000
 (C) ENIAC
 (D) PARAM 6000

6. The material which can be deformed permanently by heat and pressure is called a :

- (A) thermoplastic
 (B) thermoset
 (C) chemical compound
 (D) polymer

7. A light and a heavy body have equal momentum. Which one has greater Kinetic Energy ?

- (A) The light body
 (B) Both have equal Kinetic Energy
 (C) The heavy body
 (D) No correlation is possible with given data

8. A solid cylinder and a hollow cylinder, both of the same mass and same external diameter are released from the same height at the same time on an inclined plane. Both rolled down without slipping. Which one will reach the bottom first ?
- (A) Solid cylinder (B) Both together
(C) One with higher density (D) Hollow cylinder
9. Suppose the gravitational force varies inversely as the n^{th} power of the distance. Then the time period of a planet in circular orbit of radius R around the Sun will be proportional to :
- (A) R^{-n} (B) R^n
(C) $R^{(n-1)/2}$ (D) $R^{(n+1)/2}$
10. Two particles of equal mass go round a circle of radius R under the action of their mutual gravitational attraction. The speed of each particle is :
- (A) $\frac{1}{2R} \sqrt{\frac{1}{GM}}$ (B) $\sqrt{\frac{2R}{GM}}$
(C) $\frac{1}{2} \sqrt{\frac{GM}{R}}$ (D) $\sqrt{\frac{R}{GM}}$
11. Which acid is present in lemon ?
- (A) Hydrochloric Acid (B) Citric acid
(C) Lactic acid (D) Tartaric acid
12. The term PVC used in the plastic industry stands for :
- (A) Polyvinyl chloride (B) Polyvinyl carbonate
(C) Phosphor vanadium chloride (D) Phosphavinyl chloride
13. The tensile strength of a carbon nanotube is _____ times that of steel.
- (A) 10 (B) 25
(C) 100 (D) 1000
14. What among following is used to produce artificial rain ?
- (A) Copper oxide (B) Carbon monoxide
(C) Silver iodide (D) Silver nitrate

15. The number of moles of solute present in 1 kg of a solvent is called its :
- (A) Molality (B) Molarity
(C) Normality (D) Formality
16. Pollen grains of a plant whose $2n = 28$ are cultured to get callus by tissue culture method. What would be the number of chromosomes in the cells of the callus ?
- (A) 21 (B) 14
(C) 56 (D) 28
17. The most electronegative element among the following is :
- (A) Sodium (B) Bromine
(C) Fluorine (D) Oxygen
18. The oldest rocks in the earth's crust were once molten, and came from deep inside the earth. The molten rock, called magma, that spewed out in volcanic eruptions during the earth's early life and solidified into hard rock is called :
- (A) Granite (B) Basalt
(C) Igneous rocks (D) Sedimentary rocks
19. Which of the following formulas related to motion is not correct ?
- (A) $v^2 - u^2 = 2aS$ (B) $S = \frac{1}{2}at^2 + ut$
(C) $S = ut - \frac{1}{2}at^2$ (D) $v = u + at$
20. In coordinate geometry, the equation of the x-axis is :
- (A) $y = x$ (B) $y = 0$
(C) $x = 0$ (D) $y = 1$
21. One nanometre = _____ cm.
- (A) 10^{-9} (B) 10^{-8}
(C) 10^{-7} (D) 10^{-6}
22. The most commonly used bleaching agent is :
- (A) Alcohol (B) Carbon dioxide
(C) Chlorine (D) Sodium chloride

23. The octane number of zero is assigned to :
- (A) 2-methyl octane (B) n-heptane
(C) iso-octane (D) 3-methyl octane
24. $3x - 4(x + 6) =$
- (A) $x + 6$ (B) $-x - 24$
(C) $7x + 6$ (D) $-7x - 24$
25. If a computer provides database services to other, then it will be known as :
- (A) Web server (B) Application server
(C) Database server (D) FTP server
26. An elevator weighing 500 kg is to be lifted up at a constant velocity of 0.4 m/s. What should be the minimum horse power of the motor to be used ?
- (A) 1.62 h.p (B) 2.62 h.p
(C) 6.21 h.p (D) 4.23 h.p
27. The Latin word formica means ant. The name formic acid is derived from this Latin word because :
- (A) this acid, in ancient times, was used to eliminate ant-hills
(B) this corrosive acid is secreted by ants to drive away their enemies
(C) this acid was first obtained by the distillation of ants
(D) ants are attracted by the odour of this acid
28. What is LINUX ?
- (A) Malware (B) Operating System
(C) Application Program (D) Firmware
29. The inherited traits of an organism are controlled by :
- (A) RNA molecules (B) Nucleotides
(C) DNA molecules (D) Enzymes
30. The oil used in the froth floatation process is :
- (A) Coconut oil (B) Olive oil
(C) Kerosene oil (D) Pine oil
31. Items bought by a trader for \$80 are sold for \$100. The profit expressed as a percentage of cost price is :
- (A) 2.5 % (B) 20 %
(C) 25 % (D) 50 %

32. The size of a quantum dot is _____ m.
 (A) 5 (B) 5×10^{-9}
 (C) 5×10^{-10} (D) 5×10^{-11}
33. Delhi is at the distance of 200 km from Ambala. "A" sets out from Ambala at the speed of 30 km/h and "B" sets out at the same time from Delhi at a speed of 20 km / h. When will they meet each other ?
 (A) 4 hours (B) 10 hours
 (C) 6.40 hours (D) 20 hours
34. If the first term of an arithmetic progression is 6 and the 11th term is 76. What is the 5th term ?
 (A) 30 (B) 31
 (C) 33 (D) 34
35. Which level language is Assembly Language ?
 (A) high-level programming language
 (B) medium-level programming language
 (C) low-level programming language
 (D) machine language
36. The major constituent of air is :
 (A) Nitrogen (B) Carbon dioxide
 (C) Oxygen (D) Hydrogen
37. The National Chemical Laboratory is situated in :
 (A) New Delhi (B) Bangalore
 (C) Pune (D) Patna
38. Full form of URL is :
 (A) Uniform Resource Locator (B) Uniform Resource Link
 (C) Uniform Registered Link (D) Unified Resource Link
39. Movement of tongue muscle is controlled by :
 (A) facial nerve (B) trigeminal nerve
 (C) hypoglossal nerve (D) vagus nerve
40. BT brinjal is an example of transgenic crops. In this, BT refers to :
 (A) Bacillus tuberculosis (B) Biotechnology
 (C) Betacarotene (D) Bacillus thuringiensis
41. Given that a and b are integers, which of the following is not necessarily an integer ?
 (A) $2a - 5b$ (B) a^7
 (C) b^a (D) ab

42. **Structural element of Chromatin is :**
 (A) Histone
 (B) Acid protein and DNA
 (C) Nuclear matrix
 (D) Nucleosomes
43. **Read the following statements A and B.**
A: Many organs of aquatic plants float in water.
B: Large air gaps are present in the collenchyma tissues of lotus leaf.
Select the correct answer.
 (A) Statement A is correct and B is wrong
 (B) Statement B is correct and A is wrong
 (C) Statements A and B both are correct
 (D) Statements A and B both are wrong
44. **A large quantity of fluid is filtered every day by the nephrons in the kidneys. Only about 1% of it is excreted as urine. The remaining 99 % of the filtrate :**
 (A) is lost as sweat
 (B) is stored in the urinary bladder
 (C) is reabsorbed into the blood
 (D) gets collected in the renal pelvis
45. **Who wrote the famous book 'Origin of Species' ?**
 (A) Lamarck
 (B) Darwin
 (C) De Vries
 (D) Mendel
46. **More men suffer from colour blindness than women because :**
 (A) Women are more resistant to disease than men
 (B) The male sex hormone testosterone causes the disease
 (C) The colour blind gene is carried on the 'Y' chromosome
 (D) Men are hemizygous and one defective gene is enough to make them colour blind
47. **If the person shows the production of interferons in his body, chances are that he is suffering from :**
 (A) Malaria
 (B) Measles
 (C) Tetanus
 (D) Anthrax
48. **Inulin is a polymer of :**
 (A) Glucose
 (B) Galactose
 (C) Fructose
 (D) Arabinose
49. **"There is a plenty of room at the bottom." This was stated by :**
 (A) Issac Newton
 (B) Albert Einstein
 (C) Richard Feynman
 (D) Eric Drexler

50. The size of E.coli bacteria is _____ nm.
 (A) 75000 (B) 2000
 (C) 200 (D) 5
51. The most important property of nanomaterials is :
 (A) Force (B) Friction
 (C) Pressure (D) Temperature
52. The cut-off limit of human eye to see is _____ nm.
 (A) 10 (B) 100
 (C) 1000 (D) 10000
53. Ribose sugar is present in :
 (A) RNA only (B) RNA polymerase and ATP
 (C) RNA and ATP (D) RNA polymerase, RNA and ATP
54. The following are the half lives of four active isotopes. Which one of the following is the most dangerous to handle ?
 (A) 1 billion years (B) 10 years
 (C) 0.1 minute (D) 15 days
55. Which stage of malarial parasite is infective to man ?
 (A) Gametocyte (B) Merozoite
 (C) Cryptomerozoite (D) Sporozoite
56. Out of following, the hardest material found in nature is _____ .
 (A) Steel (B) Topaz
 (C) Diamond (D) Quartz
57. A contractor completed five-ninths of a job before a second contractor completed an additional one-third. What fraction of the job is left undone ?
 (A) one-ninth (B) four-ninths
 (C) two-thirds (D) eight-ninths
58. Nanotechnology, in other words, is best defined as :
 (A) Carbon engineering (B) Atomic engineering
 (C) Small technology (D) Microphysics
59. The ratio of thermal conductivity of silver to that of a carbon nanotube is _____ .
 (A) 100:1 (B) 1:100
 (C) 10:1 (D) 1:10

60. One nibble is equal to how many bits ?
 (A) 4 bits (B) 8 bits
 (C) 12 bits (D) 16 bits
61. If a computer has more than one processor then it is known as :
 (A) Uniprocess (B) Multiprocessor
 (C) Multithreaded (D) Multiprogramming
62. In which of the following form, data is stored in computer ?
 (A) Decimal (B) Binary
 (C) Hexa Decimal (D) Octal
63. Technology used to provide internet by transmitting data over wires of telephone network is :
 (A) Transmitter (B) Diodes
 (C) HHL (D) DSL
64. What is full form of ALU ?
 (A) Arithmetic logic unit (B) Allowed logic unit
 (C) Ascii logic unit (D) Arithmetic least unit
65. Who was the Founder of Bluetooth ?
 (A) Ericson (B) Martin Cooper
 (C) Steve Jobs (D) Apple
66. In banking, railways, etc. which computers are used :
 (A) Mini Computers (B) Micro Computers
 (C) Main Frames (D) Super Computers
67. Name of the instrument to measure atomspheric pressure :
 (A) Barometer (B) Barograph
 (C) Bolometer (D) Callipers
68. Which instrument is used in submarine to see the objects above sea level ?
 (A) Pykometer (B) Polygraph
 (C) Photometer (D) Periscope
69. Alfred Nobel invented :
 (A) X ray (B) Diesel Engine
 (C) Dynamite (D) Dynamo

70. Radiocarbon is produced in the atmosphere as a result of :
- (A) collision between fast neutrons and nitrogen nuclei present in the atmosphere
 - (B) action of ultraviolet light from the sun on atmospheric oxygen
 - (C) action of solar radiations particularly cosmic rays on carbon dioxide present in the atmosphere
 - (D) lightning discharge in atmosphere
71. The absorption of ink by blotting paper involves :
- (A) Capillary action phenomenon
 - (B) Viscosity of ink
 - (C) Siphon action
 - (D) Diffusion of ink through the blotting
72. Light year is a unit of :
- (A) Time
 - (B) Light
 - (C) Distance
 - (D) Intensity of light
73. If no external force acts on a system of bodies, the total linear momentum of the system of bodies remains constant. Which law states this ?
- (A) Newton first law
 - (B) Newton second law
 - (C) Newton third law
 - (D) Principle of conservation of linear momentum
74. The rotational effect of a force on a body about an axis of rotation is described in terms of :
- (A) Centre of gravity
 - (B) Centripetal force
 - (C) Centrifugal force
 - (D) Moment of force
75. What are the values of x and y if $2x-3y=4$ and $3y-8x-2=0$:
- (A) $x=1$ and $y=2$
 - (B) $x=-1$ and $y=-2$
 - (C) $x=-1$ and $y=2$
 - (D) $x=1$ and $y=-2$