

Lumbini Technological University
Institute of Engineering & Information Technology
4 Years B.Tech. in Computer Science & Artificial Intelligence (B.Tech. in CS & AI)
Entrance Examination
Model Question (2080)

Maths

25 X 1 = 25

1. If $D = \begin{vmatrix} 0 & a & b \\ -a & 0 & c \\ -b & -c & 0 \end{vmatrix}$ then D equals

- (a) $-abc$ (b) $2abc$ (c) 0 (d) $a^2 + b^2 + c^2$

2. Sum of the roots of quadratic equation $3x^2 - 9x + 5 = 0$

- (a) 3 (b) 6 (c) -3 (d) 2

3. A square matrix A is invertible if $|A|$ is equal to

- (a) non-zero (b) 0 (c) 1 (d) -1

4. If a, b, c are in H.P. then b =

- (a) $\frac{a+b}{2ab}$ (b) $\frac{a+c}{2ac}$ (c) $\frac{2ac}{a+c}$ (d) $\frac{2ab}{a+b}$

5. The locus of a point is a circle when

- (a) $e = 1$ (b) $e < 1$ (c) $e > 1$ (d) done

6. Which of the following cannot be the equation of circle?

- | | |
|-------------------------------|-------------------------------|
| (a) $x^2 + y^2 - 7 = 0$ | (b) $x^2 + xy + y^2 = 5$ |
| (c) $x^2 + y^2 - 7x + 5y = 2$ | (d) $x^2 + y^2 = 3x - 2y + 4$ |

7. If the variance is 625, what is the standard deviation?

- (a) 5 (b) 15 (c) 25 (d) 35

8. If $nP_2 = 12$ then value of n is

- (a) 5 (b) 4 (c) 6 (d) 3

9. The number of ways in which a student can choose 6 subjects out of 10 subjects, if 2 subjects are compulsory is

- (a) ${}^{10}C_6$ (b) 8C_6 (c) ${}^{10}C_4$ (d) 8C_4

10. The Value of $\tan^2 \theta - \sec^2 \theta$ is

- (a) 1 (b) 0 (c) -1 (d) 2

11. Which of the following is the value of $\lim_{x \rightarrow \infty} \left(\frac{4-x^2}{x^2-1} \right)$?

- (a) 1 (b) 0 (c) -4 (d) -1

12. The derivative of a function $f(x)$ is

- (a) $f'(x) = \lim_{\Delta x \rightarrow 0} \left(\frac{f(x + \Delta x) + f(x)}{\Delta x} \right)$ (b) $f'(x) = \lim_{\Delta x \rightarrow 0} \left(\frac{f(x + \Delta x) - f(x)}{\Delta x} \right)$
(c) $f''(x) = \frac{f(x + \Delta x) - f(x)}{\Delta x}$ (d) $f''(x) = \frac{f(x + Dx) + f(x)}{\Delta x}$

13. The value of i^{25} is

- (a) 1 (b) -1 (c) i (d) $-i$

14. If $y = h(\sin x)$ then $\frac{dy}{dx}$ is

- (a) $\tan x$ (b) $\cot x$
(c) $\cos x$ (d) $\sin x$

15. The function $f(x) = x^2 - 2x$ is increasing in the interval.

- (a) $x > 1$ (b) $x \leq -1$ (c) $x \geq -1$ (d) $x \leq 1$

16. $\int (2x+1)^5 dx$ is

- (a) $\frac{(2x+1)^6}{12} + C$ (b) $\frac{(2x+1)^6}{6} + C$
(c) $6(2x+1)^5 + C$ (d) $12(2x+1)^5 + C$

17. The order and degree of the differential equation $\left(\frac{d^3y}{dx^3} \right)^2 + \left(\frac{d^2y}{dx^2} \right)^2 = x$ is

- (a) 6, 9 (b) 3, 6 (c) 3, 2 (d) 2, 3

18. When two vectors \vec{a} & \vec{b} are perpendicular then

- (a) $\vec{a} \cdot \vec{b} = 0$ (b) $\vec{a} \times \vec{b} = 0$ (c) $\vec{a} \cdot \vec{b} = 1$ (d) $\vec{a} \times \vec{b} = 1$

19. The midpoint of the points (1, 4, 6) and (5, 8, 10) is

- (a) (6, 12, 8) (b) (3, 6, 8) (c) (1, 9, 12) (d) (4, 9, 12)

20. The point (1, 0, -1) lies on

- (a) Y-axis (b) X-axis (c) XZ-plane (d) space

21. If A and B are sets and $A \cup B = A \cap B$, then

- | | |
|---------------------|---------------------|
| (a) $A = \emptyset$ | (b) $B = \emptyset$ |
| (c) $A = B$ | (d) $A \subset B$ |

22. The set $A = \{x : x \in \mathbb{N} \text{ and } x^2 + 3x + 2 = 0\}$ is

- | | |
|------------------|------------------------------|
| (a) Null set | (b) Finite set |
| (c) Infinite set | (d) A set with two elements. |

23. The number of subsets of a set containing n elements is

- | | |
|---------------|-----------|
| (a) n^2 | (b) 2^n |
| (c) 2^{n-1} | (d) $2n$ |

24. When a dice is thrown, probability of getting an even number is

- (a) $\frac{1}{6}$ (b) $\frac{1}{2}$ (c) $\frac{1}{3}$ (d) $\frac{1}{4}$

25. A function $f(x)$ is said to be an odd function if

- (a) $f(-x) = f(x)$
(b) $f(-x) = -f(x)$
(c) $f(-x) = k f(x)$ where k is a constant
(d) $f(-x) = k + f(x)$ where k is a odd number.

Physics

25 X 1 = 25

26) The force per unit charge is known as.....

- (a) Electric current (b) Electric potential (c) Electric field (d) Electric space

27) gives the information on field strength, direction, and nature of the charge.

- (a) Electric current (b) Electric flux (c) Electric field (d) Electric potential

28) Two fixed charges q and 4q are at r distance apart. What will be position of third charge to be placed so that the system will be in equilibrium?

- (a) $2r/3$ from 4q (b) $2r$ from q

(c) $r/2$ from q

(d) $r/2$ from $4q$

29). Kirchhoff's voltage law is based on the principle of conservation of

- (a) charge (b) energy (c) momentum (d) mass of charges

30) A bullet fired into a fixed target loses half of its velocity after penetrating 3 cm, the further distance travelled before coming to the rest is

- (a) 4 cm. (b) 2 cm. (c) 3 cm. (d) 1 cm.

31) A simple pendulum when set into vibration comes to rest after sometimes because of

- (a) friction of air (b) tension in the thread (c) gravity (d) its mass

32) Powder clings to the skin because of

- (a) Compression (b) Cohesion (c) Adhesion (d) Capillarity

33) Viscosity is the inherent property of liquids and gases and is more closely related to

- (a) Inertia (b) Shearing strain (c) Transfer of momentum (d) Surface tension

34) If initial velocity of a projectile is 'doubled, the maximum range will be

- (a) 2 times (b) 4 times (c) 8 times (d) 16 times

35) A train of length 600 m is travelling with a velocity of 64 km/ hr. The time taken by the train to cross clearly a bridge of 1 km will be

- (a) 1.5 sec (b) 1.5 min (c) 15 sec (d) 15 min

36) In which region of electromagnetic spectrum does the Lyman series of H atom lie?

- (a) Ultraviolet (b) visible (c) infrared (d) microwave

37). Electrons in the atoms are held due to

- (a) Nuclear forces (b) Coulomb forces
(c) Van der Waals force (d) Gravitational forces

38) Which series of H atom lies in visible region?

- (a) Lyman (b) Bracket and Paschen (c) Balmer (d) Paschen

39) When a radioactive element emits an α -particle the mass number of the atom

- (a) increase by one (b) decreases by one (c) remains the same (d) decreases by four

40) The equation of sound wave is $y = 0.0015 \sin(62.4x + 316t)$ The wave length of sound wave is

(a) 0.2 unit (b) 0.1 unit (c) 3.3 unit (d) not known from the given equation

41) The radius of Earth is 6400 km. The capacitance is

- (a) 6400 MF (b) 6400 F (c) 1 F (d) $711 \mu\text{F}$

42) Two wires of same material have lengths L and 2L and cross reaction areas 4A and A respectively. The ratio of their specific resistances would be

- (a) 1:1 (b) 1:8 (c) 8:1 (d) 1:2

43) Light travels through a glass plate of thickness t and refractive index n. If C is the velocity of light in vacuum, the time taken by light to travel this thickness is

- a. t/nc b. cnt c. nt/c d. tc/n

44) The image of an object placed at the focus of convex mirror is at a distance

- (a) ∞ (b) F (c) 2f (d) $f/2$

45) A person cannot see objects clearly beyond 50 cm. The power of the lens to correct the vision is

- (a) +5 D (b) —5 D (c) —0.5 D (d) —2 D

46) When a cylinder is heated, its length increases by 2%, the area of its base will increase by:

- (a) 0.5% (b) 1% (c) 2% (d) 4%

47) The photoelectric is based on the law of conservation of

- (a) energy (b) mass (c) momentum (d) angular momentum of photons

48) NPN transistors are most preferred than that of PNP transistor. It is because of

- (a) low cost. (b) capable of handling low power.
(c) Low dissipation of energy. (d) high mobility of electrons than holes

49) On increasing the reserve bias to a large value in a p-n junction diode, the current

- (a) increases slowly (b) remains fixed (c) decreases slowly (d) suddenly increases

50) The half-life of a substance is 1600 years. The mean life is

- a. 1600 years b. 3200 years c. 800 years d. 2309 years

Chemistry

25 X 1 = 25

51) How many oxygen atoms are present in 8.0 g of oxygen?

- (a) 6.023×10^{23} (b) 3.0115×10^{23} (c) 7.83×10^{23} (d) 5.83×10^{23}

52) A green color is formed in Lassaigne's test if nitrogen is present in an organic compound. This green color is due to the information of

- (a) $\text{Fe}_4[\text{Fe}(\text{CN})_6]_3$ (b) $\text{Fe}(\text{CNS})_3$ (c) $\text{Na}_4[\text{Fe}(\text{CN})_5\text{NOS}]$ (d) $\text{Na}[\text{Fe}(\text{CN})_6]$

53) Which of the following is an amphoteric oxide?

(a) CaO (b) MgO (c) CuO (d) ZnO

54) Down's process is used for the extraction of
(a) ammonia (b) nitric acid (c) sodium (d) sulphuric acid

55) Ammonia is manufactured by
(a) Haber's process (b) Contact process (c) Down's process (d) Ostwald's process

56) Which of the following compounds is used as the best anti-knocking agent?
(a) Tetraethyl lead (b) methane (c) methoxy propane d. methyl cyanide

57) The normality of 7.3% solution of HCl is
(a) 0.2N (b) 2.0N (c) 7.3 N (d) 0.1N

58) 3. For a reaction $A + B \rightarrow C$, the experimental rate law is found to be $R = k[A]^{1/2}[B]^{1/2}$.
Find the rate of the reaction when $[A] = 0.5\text{ M}$, $[B] = 0.1\text{ M}$ and $k=0.03$.
(a) $4.74 \times 10^{-2} (\text{L/mol})^{1/2} \text{ s}^{-1}$ (b) $5.38 \times 10^{-2} (\text{L/mol})^{1/2} \text{ s}^{-1}$
(c) $5.748 \times 10^{-2} (\text{L/mol})^{1/2} \text{ s}^{-1}$ (d) $4.86 \times 10^{-2} (\text{L/mol})^{1/2} \text{ s}^{-1}$

59) Which of the following decreases with the increase in temperature?

(a) Molarity (b) Molality (c) Mole fraction (d) Mole number

60) Equivalent weight of potassium dichromate in an acidic medium is equal to its
(a) mol. wt./6 (b) mol. wt./3 (c) mol. wt./4 (d) mol. wt./2

61) Al_4C_3 reacts with water to give

(a) CH_4 (b) C_2H_2 (c) H_2 (d) C_2H_4

62) Haematite is an ore of

(a) iron (b) copper (c) mercury (d) silver

63) Cinnabar is an ore of

(a) zinc (b) copper (c) mercury (d) iron

64) Which of the following is an amorphous solid?

(a) Quartz (b) Quartz glass (c) Graphite (d) Salt (NaCl)

65) An electrochemical cell generally consists of a cathode and an anode. Which of the following statements is correct with respect to the cathode?

(a) Oxidation occurs at the cathode (b) Electrons move into the cathode
(c) Usually denoted by a negative sign (d) Is usually made up of insulating material

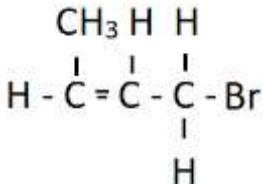
66) How does a catalyst change during a reaction?

- (a) Physically (b) Mass-wise (c) Chemically (d) Quantitatively

67) Which of the following is not a direct factor affecting the rate of a reaction?

- (a) Temperature (b) Presence of catalyst (c) Order of reaction (d) Molecularity

68) What is the IUPAC name of the following compound?



69) MgO is an example of

- (a) basic oxide (b) amphoteric oxide (c) neutral oxide (d) acidic oxide

70) Protein is a polymer of

- (a) glycol (b) glucose (c) α - amino acid (d) phthalic acid

71) Which of the following solutions cannot conduct electricity?

- (a) Sugar in water (b) NaCl in water (c) MgCl₂ in water (d) KCl in water

72). DDT is an example of

- (a) insecticide (b) herbicide (c) fungicide (d) rodenticide

73) Fat is a

- (a) Lipid (b) carbohydrate (c) protein (d) amino acid

74) Bakelite is made by the action of

75) 1 calorie is equal to

- (a) 4.184 joules (b) 5.184 joules (c) 3.184 joules (d) 2.184 joules

English

15 X 1 = 15

76) I saw old man yesterday.

- (a) a (b) an (c) the (d) no article

77) He has climbed Mt. Everest.

(a) a (b) an (c) the (d) none

- 78) His speech in English was it was completely incomprehensible.
(a) more complicated so (b) such complicated so
(c) so complicated that (d) much complicated that
- 79) The young man almost encountered but to everyone's surprise he pulled through.
(a) dead (b) death (c) being dead (d) dying
- 80) Sita was very conscious her weakness.
(a) by (b) in (c) for (d) of
- 81) There were people in the hall, so we were not completely alone.
(a) very little (b) little (c) fewer (d) a few
- 82) For me, breakfast is best meal of the day.
(a) a (b) an (c) the (d) none of the above
- 83) Children recited Poem in Honour of Prime minister
(a)the, a, an, a (b) a, the, the, the
(c)no article, a, an, the (d) the, a, the, the
- 84) Emma is older Alice, while Jolie is oldest.
(a) than, an (b) from, the (c) then, the (d) than, the
- 85) I can't walk anymore, I'm tired.
(a) too (b) so (c) such (d) so such
- 86) My brother was trembling cold.
(a) from (b) with (c) of (d) by
- 87) Which of the following is the synonym of the word "MASSIVE"?
(a)Strong (b) Gaping (c) Huge (d) Burst
- 88) Which of the following is the Antonym of the word "FOREMOST"
(a)Hindmost (b) Unimportant (c) Disposed (d) Mature
- 89) What time
(a) the train leaves? (c) is the train leaving?
(b) leaves the train? (d) does the train leave?
- 90) They went to the parkthe rain.
(a) despite (b) in spite (c) under (d) avoiding

Computer

10 X 1 = 10

- 91) Which of the following is not a characteristic of a computer?
a) Versatility b) Accuracy c) Diligence d) I.Q.

92) Which of the following is the smallest unit of data in a computer?

- a) Bit
- b) KB
- c) Nibble
- d) Byte

93) Which of the following is an output device?

- a) Keyboard
- b) Mouse
- c) Light pen
- d) VDU

94) Which of the following values is the correct value of this binary code 1011 and 1111?

- a) 11 and 14
- b) 12 and 15
- c) 11 and 15
- d) 12 and 14

95) Which of the following statement is correct about the virus?

- a) The virus is a small program that infects a large program in the user system.
- b) The virus is a file of the hacker.
- c) The virus is an operating system that controls the entire OS.
- d) None of the these

96) What is the full form of COBOL?

- (a) Common Basic Operating Language
- (b) Computer Basic Oriented Language
- (c) Computer Based Operating Language
- (d) Common Business Oriented Language

97) What is the full form of PNG in the computer image format ?

- (a) Printable New Graphics
- (b) Portable New Graphics
- (c) Portable Network Graphics
- (d) Printable Network Graphics

98) Which of the following statement is correct about the URL?

- a) URL is a software that connects to the internet
- b) URL is the address of the web page
- c) URL is the domain name
- d) All of the these

99) A _____ is an application that allows the user to compose and edit simple documents.

- a) Word processor
- b) Spreadsheet
- c) Email utility
- d) Browsers

100) A program that can retrieve files from the world wide web and render text, images or sounds encoded in the files.

- (a) Browser
- (b) Internet
- (c) Server
- (d) Web Server