



SANGOLA COLLEGE, SANGOLA
 Department of Computer Science and Application
 (Affiliated to Punyashlok Ahilyadevi Holkar Solapur University, Solapur)
B.Sc.(ECS) SANG – CET 2022



Exam Seat No.

OMR Sheet No.

Exam Seat No.(In words) _____

Sign. of the Supervisor: _____

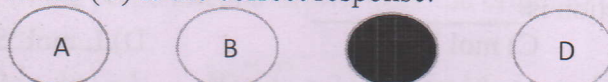
Day and Date: Tuesday 05/07/2022

Time: 11:00 AM to 12:00 PM

Maximum Marks: 100

General Instructions:

1. Write your Seat No. and OMR Sheet No. in the space provided on the top of this page.
2. Section I- Physics, Section II- Chemistry and Section III- Mathematics or Biology.
3. Choice and sequence for attempting questions will be as per the convenience of the candidate.
4. Read each question carefully
5. Each question with correct response shall be awarded two (2) marks. **There shall be no negative marking**
6. Each question has four alternative responses marked (A), (B), (C) and (D). You have to darken the circle as indicated below on the correct response against each item at given OMR sheet.
 Example: where (C) is the correct response.



7. Your responses to the items are to be indicated in the given OMR Sheet. If you mark at any place other than in the circle in the OMR Sheet, it will not be evaluated.
8. Use Blue ink ball pen only.

Section-I Physics

- 1) Angle of banking does not depend upon _____
 A) gravitational acceleration B) speed of vehicle C) radius of curvature of road D) mass of vehicle
- 2) Water flowing in flooded river illustrates which type of flow?
 A) turbulent flow B) laminar flow C) viscous flow D) streamline flow
- 3) For monoatomic gas, the ratio of two specific heats C_p/C_v is _____
 A) 3/5 B) 5/3 C) 7/3 D) 3/7
- 4) A process in which temperature remains constant is called as _____
 A) adiabatic process B) cyclic process C) isobaric process D) isothermal process
- 5) The period of a body performing S.H.M of frequency 5 Hz is _____
 A) a/5 sec B) 5a sec C) 1/5 sec D) 5 sec
- 6) Beats are example of _____
 A) diffraction B) interference C) polarization D) reflection
- 7) For constructive interference the phase difference between the two waves should be _____
 A) $0, \frac{\pi}{2}, \pi, \dots$ B) $0, 2\pi, 4\pi, \dots$ C) $\pi, 3\pi, 7\pi, \dots$ D) $\frac{\pi}{4}, \frac{\pi}{2}, 3\frac{\pi}{4}, \dots$
- 8) The capacity of condenser is $2\mu F$. It is charged up to a charge of $100 \mu C$. The Energy stored by the condenser is _____
 A) $0.25 \times 10^{-4} J$ B) $2.5 \times 10^{-3} J$ C) $25 \times 10^{-3} J$ D) $0.25 \times 10^{-3} J$
- 9) The series combination of galvanometer & high resistance is called _____
 A) ohm-meter B) ammeter C) potentiometer D) Voltmeter
- 10) In a moving coil galvanometer, the deflection of coil is related to electric current i by the relation _____
 A) $i \propto \tan \theta$ B) $i \propto \theta$ C) $i \propto \theta^2$ D) $i \propto \sqrt{\theta}$

- 11) SI unit of magnetic field intensity is _____
 A) $A \cdot m^{-1}$ B) $A \cdot m^{-2}$ C) $A \cdot m^2$ D) $A \cdot m$
- 12) In step down transformer, the secondary current is _____ primary current.
 A) less than B) greater than C) equal to D) any other value
- 13) If the frequency of A.C. is doubled, the reactance of inductor is _____
 A) doubled B) halved C) one third D) one fourth
- 14) By increasing the intensity of incident light on the surface of a metal _____
 A) K.E of photoelectron increases B) number of emitted electron increases
 C) K.E & number of electrons increases D) no effect.
- 15) The output of AND gate is _____
 A) $Y = A \cdot B$ B) $Y = A + B$ C) $Y = \overline{A + B}$ D) $\overline{Y} = A \cdot B$

Section-II Chemistry

- 16) 2 Moles of Hydrogen gas at NTP occupy a volume of _____.
 A) 2 L B) 11.2 L C) 22.4 L D) 44.8 L
- 17) The structure of acetylene molecule is _____.
 A) Tetrahedral B) Trigonal planar C) Angular D) Linear
- 18) Oxidation number of oxygen in ozone (O_3) is _____.
 A) Zero B) +1 C) +2 D) +3
- 19) If salt bridge is removed from two half cells the voltage _____.
 A) Drops to zero B) does not change C) increases gradually D) increases rapidly
- 20) The unit for rate constant of first order reaction is _____.
 A) S^{-1} B) $mol L^{-1} S^{-1}$ C) $mol L^{-1}$ D) $L mol^{-1} S^{-1}$
- 21) Calcium format on dry distillation yields _____.
 A) Acetone B) Formaldehyde C) Acetic Acid D) Acetaldehyde
- 22) When 2-hydroxybenzoic acid is distilled with zinc dust it gives _____.
 A) Phenol B) benzoic acid C) benzaldehyde D) polymeric compound
- 23) Which of the following is not a pair of isomorphous substances?
 A) Cr_2O_3 and Fe_2O_3 B) $NaNO_3$ and KCO_3 C) K_2SO_4 and K_3SeO_4 D) NaF and MgO
- 24) Select the correct type of solution for iodine in air.
 A) gas in gas B) solid in gas C) gas in liquid D) gas in solid
- 25) In plants, the process of photosynthesis is _____.
 A) an open system B) a closed system C) an isolated system D) a homogeneous system
- 26) Bond dissociation energy is minimum in
 A) F_2 B) Cl_2 C) Br_2 D) I_2
- 27) The primary valency of a metal ion in $K_2[Ni(CN)_4]$ is
 A) Four B) Zero C) Two D) Six
- 28) IUPAC name of tert.butyl alcohol is
 A) Butan-1-ol B) 2-Methyl-propan-1-ol C) 2-Methyl-propan-2-ol D) Butan-2-ol
- 29) Carbon - halogen bond in alkyl halides is formed through the overlap
 A) $SP^3 - P$ B) $SP^3 - SP^3$ C) $SP^2 - P$ D) $SP^3 - S$
- 30) Most correct electronic configuration of chromium is
 A) $[Ar]3d^3 4s^2$ B) $[Ar]3d^4 4s^2$ C) $[Ar]3d^5 4s^1$ D) $[Ar]3d^5 4s^2$

Section-III Maths

- 31) The inverse of logical statement $p \rightarrow q$ is _____.
 A) $\sim p \rightarrow \sim q$ B) $p \leftrightarrow q$ C) $q \rightarrow p$ D) $q \leftrightarrow p$
- 32) $\frac{\cos \theta}{1 + \sin \theta} =$ _____.
 A) $\cot(\frac{\pi}{4} - \theta)$ B) $\cot(\frac{\pi}{4} + \theta)$ C) $\tan(\frac{\pi}{4} - \theta)$ D) $\tan(\frac{\pi}{4} + \theta)$

33) If $A = \begin{bmatrix} 5 & 4 \\ 4 & 3 \end{bmatrix}$, then $A^{-1} =$ _____.

A) $\begin{bmatrix} 3 & -4 \\ -4 & 5 \end{bmatrix}$

B) $\begin{bmatrix} 3 & 4 \\ 4 & 5 \end{bmatrix}$

C) $\begin{bmatrix} -3 & 4 \\ 4 & -5 \end{bmatrix}$

D) $\begin{bmatrix} 1 & 2 \\ -3 & 2 \end{bmatrix}$

34) The centre and radius of the circle $x^2 + y^2 - 2x + 4y - 4 = 0$ are

A) (1,-2), 3

B) (1,2), 3

C) (-1,2), 3

D) (-1,-2), 3

35) $\tan^{-1}\left(\frac{1}{2}\right) + \tan^{-1}\left(\frac{1}{3}\right) =$ _____.

A) 0

B) $\frac{\pi}{6}$

C) $\frac{\pi}{4}$

D) $\frac{-\pi}{4}$

36) Find the combine equation of the lines passing through the origin and having slopes 3 and 2.

A) $6x^2 + 5xy + y^2 = 0$

B) $6x^2 - 5xy + y^2 = 0$

C) $x^2 + 5xy + 6y^2 = 0$

D) $x^2 - 5xy + 6y^2 = 0$

37) If w is a complex cube root of unit, then $w^2 + w^3 + w^4 =$ _____.

A) -1

B) 1

C) 0

D) w

38) If $\vec{a}, \vec{b}, \vec{c}$ are position vectors of points A, B, C respectively such that $3\vec{a} + 5\vec{b} = 8\vec{c}$, then A divides BC.

A) externally in the ratio 5:8

B) internally in the ratio 5:8

C) externally in the ratio 8:5

D) internally in the ratio 8:5

39) The volume of the parallelepiped with co-terminus edges given by the vectors $\hat{j} + \hat{k}, \hat{k} + \hat{i}, \hat{i} + \hat{j}$ is _____.

A) 3 cu. units

B) 4 cu. Units

C) 1 cu. Units

D) 2 cu. Units

40) If the foot of the perpendicular drawn from the origin to the plane is (1,2,3) then the equation of the plane is _____.

A) $\vec{r} \cdot (\hat{i} + 2\hat{j} + 3\hat{k}) = 1$

B) $\vec{r} \cdot (\hat{i} + 2\hat{j} + 3\hat{k}) = 14$

C) $\vec{r} \cdot (\hat{i} + 2\hat{j} + 3\hat{k}) = 9$

D) $\vec{r} \cdot (\hat{i} + 2\hat{j} + 3\hat{k}) = 4$

41) The maximum value of $z = 9x + 11y$, subject to $3x + 2y \leq 12, 2x + 3y \leq 12, x \geq 0, y \geq 0$ is _____.

A) 44

B) 54

C) 36

D) 48

42) If $y = \sqrt{\sin \sqrt{x}}$, then $\frac{dy}{dx} =$ _____.

A) $\frac{\cos \sqrt{x}}{4\sqrt{x \sin \sqrt{x}}}$

B) $\frac{-\cos \sqrt{x}}{2\sqrt{\sin \sqrt{x}}}$

C) $\frac{\cos x}{\sqrt{\sin x}}$

D) $\frac{-\cos x}{\sqrt{\sin x}}$

43) If $y = \tan^{-1}\left(\frac{6x}{1-8x^2}\right)$, then $\frac{dy}{dx} =$ _____.

A) $\frac{4}{1+16x^2} - \frac{2}{1+4x^2}$

B) $\frac{4}{1+16x^2} + \frac{2}{1+4x^2}$

C) $\frac{2}{1+4x^2} - \frac{1}{1+x^2}$

D) $\frac{2}{1+4x^2} + \frac{1}{1+x^2}$

44) Maximum area of a rectangle whose perimeter is given as 24 meters is equal to _____.

A) 36 m²

B) 49 m²

C) 64 m²

D) 81 m²

45) If $f(x) = 2x^2 + bx + c$, and $f(0) = 3, f(2) = 1$ then $f(1) =$ _____.

A) 2

B) 0

C) 1

D) 3

46) $\int \tan^2 x \, dx =$ _____.

A) $\tan x + x + c$

B) $-\cot x - x + c$

C) $\tan x - x + c$

D) $-\cot x + x + c$

47) $\int_0^{\frac{\pi}{2}} \frac{\sqrt{\sin x}}{\sqrt{\sin x} + \sqrt{\cos x}} \, dx =$ _____.

A) 0

B) $-\pi$

C) $\frac{3\pi}{2}$

D) $\frac{\pi}{4}$

48) The area of region bounded by the curve $y = \cos x, x = 0$ and $x = \pi$ is _____.

A) 1 sq. unit

B) 4 sq. units

C) 2 sq. units

D) 3 sq. units

49) The order and degree of the differential equation $\left(\frac{d^2y}{dx^2}\right)^3 + \left(\frac{dy}{dx}\right)^4 - xy = 0$ are respectively

A) 2, 4

B) 3, 2

C) 4, 5

D) 2, 3

50) For $X \sim B(n, p)$ if $n = 10, p = 0.4$ then $E(X) =$ _____.

A) 0.4

B) 2.4

C) 4

D) 24

Section-III Biology

- 31) Pace maker of Heart is _____.
 A) S A Node B) AV Node C) bundle of HIS D) Purkinje fibre
- 32) Rupturing of follicles and discharge of ova is known as _____.
 A) Copulation B) Capacitation C) ovulation D) gestation
- 33) Which of the following disease affects the immune system directly?
 A) Cholera B) Tuberculosis C) AIDS D) Tetanus
- 34) Thermoregulatory center in the body is _____.
 A) hypothalamus B) Cerebellum C) Spinal cord D) Pituitary
- 35) Interaction in which one species benefits and other is neither harmed nor benefitted such interaction called _____.
 A) Mutualism B) Competition C) Commensalism D) Parasitism
- 36) The connecting link between ape and man is
 A) Dryopithecus B) Australopithecus C) Homoerectus D) Homo-neanderthalensis
- 37) _____ is sound producing organ.
 A) Tonsils B) Pharynx C) Larynx D) Trachea
- 38) _____ chromosomes appears 'V' shaped during Anaphase.
 A) Telocentric B) Acrocentric C) Meta centric D) Sub meta centric
- 39) The sum total of genes of all individuals of interbreeding or mendelian population is called _____.
 A) gene frequency B) gene mutation C) gen flow D) gene pool
- 40) How many pollengrains produced by 25 microspore mother cells
 A) 25 B) 100 C) 75 D) 50
- 41) In DNA segment amount of Adenine is 20 find out amount of cytosine.
 A) 10 B) 20 C) 50 D) 30
- 42) Find the path of water from soil to xylem.
 A) Soil → Root hair → cortex → endodermis → Protoxylem → metaxylem
 B) Soil → Root hair → endodermis → Cortex → Pericycle → metaxylem
 C) Root hair → cortex → Pericycle → Protoxylem → metaxylem
 D) metaxylem → cortex → Endodermis → Pericycle → Root hair
- 43) Which of the following is non-symbiotic bio-fertilizer?
 A) Rhizobium B) Azotobacter C) Anabaena D) VAM
- 44) Mushrooms are rich in _____.
 A) Minerals and Vitamins B) Fats C) Carbohydrates D) Sugars
- 45) What is molecular scissor/genetic scalpel?
 A) Urease B) Restriction endonuclease C) Helicase D) Peptidase
- 46) Most common plant of floating leaves stage of hydrospre is _____.
 A) Duck week B) Hydrilla C) Lotus D) Water hyacinth
- 47) What are the different parts A, B and C in the adjacent figure?
 A) (A-Base) (B-stalk) (C-Head) B) (A-Tip) (B-rod) (C-foot)
 C) (A-Cap) (B-Stalk) (C-foot) D) (A-Head) (B-Stalk) (C-Base)
- 48) Lactose is composed of _____.
 A) Glucose + Fructose B) Glucose + Glucose C) Glucose + Galactose D) Fructose + Glucose
- 49) Which ratio is constant for DNA of a particular species?
 A) A+T/G+C B) A-C/T+G C) A+U/C+G D) A+G/C+T
- 50) The form of biological energy used in the Respiration is _____.
 A) Radiant B) Electrical C) Chemical D) Mechanical

----- Rough Work -----



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B.Sc.(ECS) SANG – CET 2022

SET- A

Answer Key

Section-I

1	D
2	A
3	B
4	D
5	C
6	B
7	B
8	B
9	D
10	B
11	A
12	B
13	A
14	B
15	A

Section-II

16	D
17	D
18	A
19	A
20	A
21	B
22	A
23	C
24	B
25	A
26	D
27	C
28	C
29	A
30	C

Section-III

31	A	46	C
32	C	47	D
33	C	48	C
34	A	49	D
35	C	50	C
36	B		
37	C		
38	C		
39	D		
40	B		
41	D		
42	A		
43	B		
44	A		
45	B		