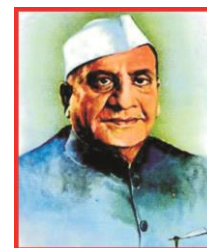




SHRI SHIVAJI EDUCATION SOCIETY AMRAVATI'S
SCIENCE COLLEGE, PAUNI
DISTRICT: BHANDARA (M.S.)
'B' Grade Reaccredited College by NAAC, Bangalore



Student's Performance Test for B.Sc. Semester I

Academic Session: 2016-17

Time: 01 Hr.

Course Name: B.Sc. Maths

Max. Marks: 60

Name of the student: Signature of the Invigilator.....

Instructions:

1. The test comprises **30** multiple type questions from **Chemistry, Mathematics and Physics**
2. Each subject has **10** questions based on the previous year (12th Std.) examination.
3. Students have to attempt all the questions. 4. Each questions will carry **2** marks. 5. Student has to tick (✓) the correct option.

1. Structure of NH₃ is

- A. Tetragonal B. Tetrahedral C. Pyramidal D. Trigonal bipyramidal

2. Which one has highest bond energy?

- A. O-O B. S-S C. Se-Se D. Fe-Fe

3. Noble gas used in the miners cap lamp is

- A. Krypton B. Argon C. Helium D. Radon

4 The metal ion which is not colored, is

- A. Fe³⁺ B. V²⁺ C. Zn²⁺ D. Ti³⁺

5. Highest magnetic moment is shown by the ion

- A. V³⁺ B. Co³⁺ C. Fe³⁺ D. Cr³⁺

6. Primary and secondary valency of platinum in the complex [Pt (en)₂ Cl₂] are

- A. 4, 6 B. 2, 6 C. 4, 4 D. 6, 4

7. Vitamin B₁₂ is complex of

- A. Cobalt B. Zinc C. Vanadium D. Nickel

8. Ligands used in the estimation of hardness of water is

- A. EDTA B. DBG C. Chloride D. Bromo

9. The oxidation state of Fe in [Fe (H₂O) 5(NO)]SO₄

- A. +1 B. +2 C. +4 D. +3

10. Which of the following alkane is not formed in the Wurtz reaction

- A. Methane B. Ethane C. Propane D. Butane

11. Order of magnitude of density of uranium nucleus is

- A. 1020 kg m⁻³ B. 1017 kg m⁻³ C. 1014 kg m⁻³ D. 1011 kg m⁻³

12. Consider α and β particles and γ -rays each having an energy of 0.5 MeV. In the increasing order of penetrating power, the radiation are respectively

- A. α , β , γ B. α , γ , β C. β , γ , α D. γ , β , α

13. In nuclear reactors, the control rods are made of

- A. Cadmium B. Graphite C. Krypton D. Plutonium

14. The forbidden energy band gap in conductors, semiconductors and insulators are EG_1 , EG_2 and EG_3 respectively. The relation among them is
 A. $EG_1 = EG_2 = EG_3$ B. $EG_1 < EG_2 < EG_3$ C. $EG_1 > EG_2 > EG_3$ D. $EG_1 < EG_2 > EG_3$
15. In an n-type silicon, which of the following statements is true.
 A. Electrons are majority carriers and trivalent atoms are the dopants
 B. Electrons are minority carriers and pentavalent atoms are the dopants
 C. Holes are minority carriers and pentavalent atoms are the dopants.
 D. Holes are majority carriers and trivalent atoms are the dopants.
16. If the energy of a photon of sodium light ($\lambda = 589 \text{ nm}$) equals the band gap of semiconductor, the minimum energy required to create hole electron pair
 A. 1.1 eV B. 2.1 eV C. 3.2 eV D. 1.5 eV
17. At absolute zero, Si acts as a
 A. Metal B. Semiconductor C. Insulator D. None of these
18. What happens during regulation action of a Zener diode?
 A. The current through the series resistance (R_s) changes B. The resistance offered by the Zener changes
 C. The Zener resistance is constant D. Both A and B
19. Find the electric field inside the sphere which carries a charge density proportional to the distance from the origin $\rho = kr$
 A. ρ/ϵ_0 B. $\rho r/\epsilon_0$ C. $\rho r^2/\epsilon_0$ D. None of the above
20. A point charge (Q) is located at the center of a cube of edge length a , find the final electric flux over one face of the cube
 A. Q/ϵ_0 B. $Q/6\epsilon_0$ C. $6Q/\epsilon_0$ D. None of the above
21. Given set $A = \{1, 2, 3\}$ and a relation $R = \{(1, 2), (2, 1)\}$, the relation R will be
 A. Reflexive if $(1, 1)$ is added B. Symmetric if $(2, 3)$ is added C. Transitive if $(1, 1)$ is added D. Symmetric if $(3, 2)$ is added
22. A relation S in the set of real numbers is defined as $xSy \Rightarrow x - y + \sqrt{3}$ is an irrational number, then relation S is
 A. Reflexive B. Reflexive and symmetric C. Transitive D. Symmetric and transitive
23. Given set $A = \{a, b, c\}$. An identity relation in set A is
 A. $R = \{(a, b), (a, c)\}$ B. $R = \{(a, a), (b, b), (c, c)\}$ C. $R = \{(a, a), (b, b), (c, c), (a, c)\}$ D. $R = \{(c, a), (b, a), (a, a)\}$
24. $\tan^{-1}\{\sin(-\frac{\pi}{2})\}$ is equal to
 A. -1 B. 1 C. $\frac{\pi}{2}$ D. $-\frac{\pi}{4}$
25. If a matrix has 6 elements, then number of possible orders of the matrix can be
 A. 2 B. 4 C. 3 D. 6
26. Total number of possible matrices of order 2×3 with each entry 1 or 0 is
 A. 6 B. 36 C. 32 D. 64
27. If matrices A and B are inverse of each other then
 A. $AB = BA$ B. $AB = BA = I$ C. $AB = BA = 0$ D. $AB = 0, BA = I$
28. The diagonal elements of a skew symmetric matrix are
 A. All zeroes B. Are all equal to some scalar $k(k \neq 0)$ C. Can be any number D. None of these
29. If a matrix A is both symmetric and skew symmetric then matrix A is
 A. a scalar matrix B. a diagonal matrix C. a zero matrix of order $n \times n$ D. a rectangular matrix
30. Let A be a square matrix of order 2×2 , then $|KA|$ is equal to
 A. $K|A|$ B. $K^2|A|$ C. $K^3|A|$ D. $2K|A|$