



Name: Roll No.:

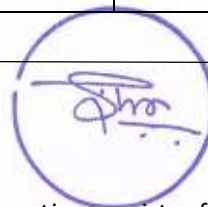
Branch: Signature of Invigilator:

Semester: VIth Date: 27/04/2022 (MORNING)

Subject with Code: CH316 NOVEL INORGANIC SOLIDS

Marks Obtained	Section A (30)	Section B (20)	Total Marks (50)

INSTRUCTION TO CANDIDATE



1. The booklet (question paper cum answer sheet) consists of two sections. First section consists of MCQs of 30 marks. Candidates may mark the correct answer in the space provided / may also write answers in the answer sheet provided. The Second section of question paper consists of subjective questions of 20 marks. The candidates may write the answers for these questions in the answer sheets provided with the question booklet.
2. The booklet will be distributed to the candidates before 05 minutes of the examination. Candidates should write their roll no. in each page of the booklet.
3. Place the Student ID card, Registration Slip and No Dues Clearance (if applicable) on your desk. All the entries on the cover page must be filled at the specified space.
4. Carrying or using of mobile phone / any electronic gadgets (except regular scientific calculator)/chits are strictly prohibited inside the examination hall as it comes under the category of unfair means.
5. No candidate should be allowed to enter the examination hall later than 10 minutes after the commencement of examination. Candidates are not allowed to go out of the examination hall/room during the first 30 minutes and last 10 minutes of the examination.
6. Write on both side of the leaf and use pens with same ink.
7. The medium of examination is English. Answer book written in language other than English is liable to be rejected.
8. All attached sheets such as graph papers, drawing sheets etc. should be properly folded to the size of the answer book and tagged with the answer book by the candidate at least 05 minutes before the end of examination.
9. The door of examination hall will be closed 10 minutes before the end of examination. Do not leave the examination hall until the invigilators instruct you to do so.
10. Always maintain the highest level of integrity. Remember you are a BITian.
11. Candidates need to submit the question paper cum answer sheets before leaving the examination hall.

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: I MSc
BRANCH: Chemistry

SEMESTER: VI
SESSION: SP/22

SUBJECT: CH316 NOVEL INORGANIC SOLIDS

TIME: 2 HOURS

FULL MARKS: 50

INSTRUCTIONS:

1. The total marks of the questions are 50.
2. Candidates may attempt for all 50 marks.
3. Before attempting the question paper, be sure that you have got the correct question paper.
4. The missing data, if any, may be assumed suitably.

Section A

1. Hindalium. It is an alloy of aluminium and magnesium with a small quantity of [1]
 - a) Fe
 - b) Ni
 - c) Cu
 - d) Cr
2. Gray iron is characterized by [1]
 - a) Carbon atoms combine with iron to form iron carbide
 - b) Free graphite hexagonal particles
 - c) Flake shape of the graphite molecules.
 - d) Spheroid shape of the graphite molecules
3. Toughness is [1]
 - a) The highest stress that a material can withstand
 - b) Material's resistance to indentation
 - c) Material's resistance to abrasion
 - d) Material's ability to absorb energy
4. Ultrahigh-carbon steels contains [1]
 - a) 1.25 to 2.0% C
 - b) 0.60 to 1.00% C
 - c) 0.30 to 0.60%
 - d) up to 0.30% C
5. Bronze contains [1]
 - a) 50 % copper and 50% tin
 - b) 50 % copper and 50% zinc
 - c) 75 to 95% copper and 5 to 25% tin
 - d) 75 to 95% copper and 5 to 25% Zinc
6. In Gun Metal zinc is added to [1]
 - a) Increase tensile strength
 - b) Increase its fluidity
 - c) Decrease corrosion
 - d) Increase ductility

7. Composite materials are classified based on: [1]
a) Type of matrix
b) Size-and-shape of reinforcement
c) Both
d) None
8. Mechanical properties of fiber-reinforced composites depend on [1]
a) Properties of constituents
b) Interface strength
c) Fiber length, orientation, and volume fraction
d) All the above
9. Which of the following is not an application of a sandwich panel? [1]
a) Fabrication of wings of aircrafts
b) Design of ships, boat hulls
c) Conveyor belts
d) Fabrication of roofs, floors and walls of buildings
10. Ion exchange resins are made of [1]
a) Polystyrene
b) Lucite
c) Teflon
d) Sulphonated bakelite
11. Commercial glass consist of [1]
a) Lime
b) Soda
c) Silica
d) All the above
12. Not a characteristic property of ceramic materials [1]
a) High temperature stability
b) High mechanical strength
c) Low elongation
d) Low hardness
13. During sintering densification is not due to [1]
a) Atomic diffusion
b) Surface diffusion
c) Bulk diffusion
d) Grain growth
14. Which of the following is the advantage of using conducting polymers in place metals? [1]
a) Cost
b) Thermal conductivity
c) Light-weight
d) None of these
15. Which is not an application of conducting polymers [1]
a) Rechargeable batteries
b) Adhesives
c) Electronics
d) Analytical sensors

16. As percentage of carbon in steel increases its ----- decreases. [2]
a) Corrosion resistance
b) Ultimate strength
c) Hardness
d) Ductility
17. In Annealing, cooling is done in which of the following medium? [2]
a) Air
b) Water
c) Oil
d) Furnace
18. A given component cracked after heat treatment. What can be the possible reason? [2]
a) It was heated for long time
b) It was not properly cleaned before heating
c) It was suddenly cooled in brine
d) It was slowly cooled in air
19. A material with two of the three dimension are in nano range and third dimension is large is known as [2]
a) Micro material
b) Quantum wire
c) Quantum Well
d) Macro material
20. The melting point of particles in nano form [2]
a) Increases
b) Decreases
c) Remains same
d) Increases then Decreases
21. Quantum dots can be used in _____ [2]
a) Crystallography
b) Optoelectronics
c) Mechanics
d) Quantum physics
22. Sol-gel method is _____ approach. [2]
a) Bottom up
b) Up bottom
c) Top down
d) Down top
23. _____ undergo hydrolysis and poly condensation reactions. [1]
a) Metal ions
b) Metal carbonates
c) Metal nitrates
d) Metal oxides

Section B

Q24. Differentiate between hot working and cold working. Differentiate between intercalation and exfoliated structure with the help of diagram. [5]

Q25. Discuss the following CNT synthesis method:
(i) Arc Discharge method (ii) Laser Ablation Method [5]

Q26. Explain the properties and application of Duralumin. [5]

Q27. Write short notes on Carbon Fiber-Reinforced Polymer (CFRP) Composites. [5]

::: DD/MM/YYYY :::::