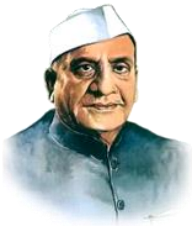
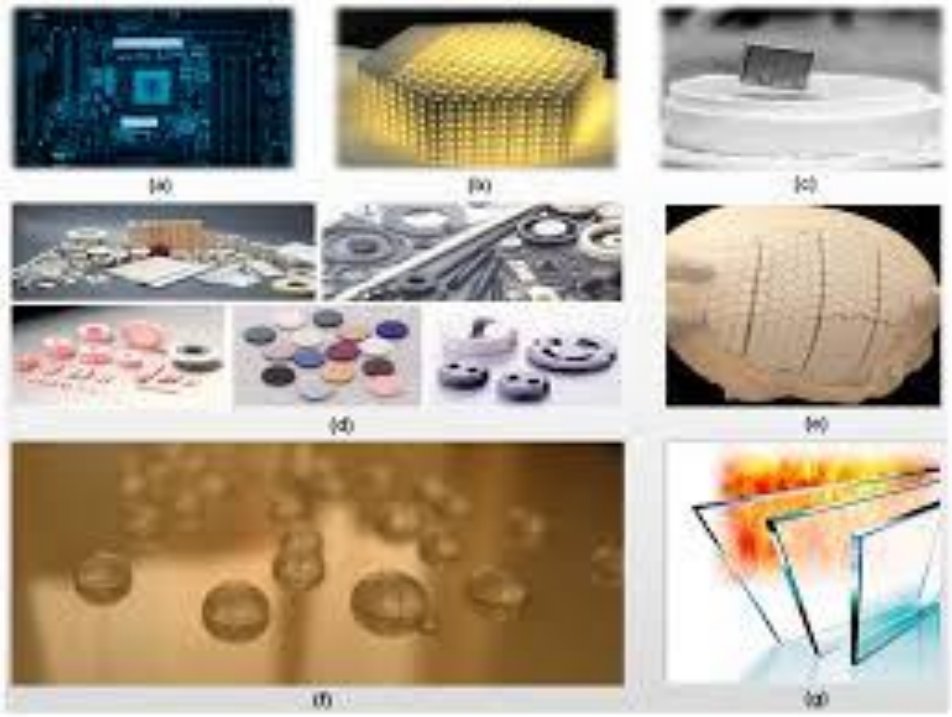


Shri Shivaji Education Society Amravati's

Science College, Nagpur

Department Of Physics

Certificate Course - Advanced Ceramics and Composites



Course Coordinator – Dr. Shahin K. Sayyad

Shri Shivaji Education Society Amravati's

Science College

Congress Nagar, Nagpur

Department Of Physics

Certificate Course Advanced Ceramics and Composites

- **Course Objectives:**

- To provide a deep understanding of the structure, properties, and applications of advanced ceramics and composites.
- To develop skills in the synthesis and processing of ceramic and composite materials.
- To enable students to analyze the mechanical, thermal, and electrical properties of these materials.
- To explore current trends and advancements in ceramics and composites.
- To prepare students for research and industrial roles in material science focusing on ceramics and composites.

- **Key Properties and Benefits of the Add-On Course on Advanced Ceramics and Composites**
- **Comprehensive Curriculum**
- **Fundamental Principles:** Gain a deep understanding of the basic science behind advanced ceramics and composites.
- **Material Properties:** Learn about the mechanical, thermal, electrical, and chemical properties of these materials.
- **Manufacturing Techniques:** Explore various fabrication and processing methods, including sintering, hot pressing, and additive manufacturing.
- **Hands-On Experience**
- **Laboratory Work:** Engage in practical experiments and projects to apply theoretical knowledge.
- **Real-World Applications:** Study case studies from industries such as aerospace, automotive, electronics, and biomedical engineering.
- **Expert Instruction**
- **Industry Professionals:** Learn from experienced instructors who are experts in the field of advanced ceramics and composites.
- **Guest Lectures:** Attend sessions with guest speakers from leading companies and research institutions.
- **Cutting-Edge Research**
- **Latest Innovations:** Stay updated on the latest advancements and trends in materials science.
- **Research Projects:** Participate in research projects and contribute to innovative developments.
- **Career Advancement**
- **Specialized Knowledge:** Enhance your expertise in a high-demand field with specialized knowledge that sets you apart.
- **Networking Opportunities:** Connect with professionals and peers in the industry through workshops, seminars, and conferences.
- **Certification:** Earn a certificate that validates your skills and knowledge, boosting your employability and career prospects.

Enroll Now

Dr. S. K. Sayyad (Co-ordinator)

Department of Physics SSES Amt's Science College Congress Nagar Nagpur

Phone: [9922901201]

Email: [shahinsayyed87@gmail.com]

Last Date of Registration:25/07/2023

Shri Shivaji Education Society Amaravati's

Science College Congress Nagar, Nagpur

Department of Physics

Report on Add-on Course
" Advanced Ceramics and Composites"
Course For Postgraduate Physics Students
Duration: 07/08/2023 to 07/10/2023

Total Students: 18

This 10-week add-on course provided postgraduate physics students with an in-depth understanding of advanced ceramics and composites. The course was conducted by Dr. S.K. Sayyad, Assistant Professor, Department of Physics SSES Amt's Science College Congress Nagar Nagpur. Total 18 Students of M.Sc. I and III Sem Physics were enrolled for the course.

The course combined theoretical knowledge with practical applications, focusing on the properties, processing techniques, and applications of these materials in various industries. The theory classes have been taken in room no. C4 from 4:00 p.m. to 5:00 p.m. every Friday and Saturday and 5:00 p.m. to 6:00 p.m. practical on Saturday in the laboratory for 10 weeks.

The students were evaluated through a combination of MCQ based written exam of 80 marks and practical lab work of 20 marks. All 18 students successfully completed the course. The overall performance was commendable, with several students showing exceptional understanding and innovative approaches in their projects.

The 10-week advanced ceramics and composites course was a significant addition to the postgraduate curriculum for physics students, providing them with critical skills and knowledge applicable in various high-tech industries. The successful completion of this course has prepared the students for further research and professional careers in materials science and engineering.

Dr. S.K.Sayyad

Course Coordinator

Department of Physics

To,
The Principal
SSES Amt's Science College,
Congress Nagar, Nagpur-12

Subject: For permission to conduct the add on courses in Physics during the session 2023-2024

Respected Sir,

This is to request you that, the teachers of Physics department have prepared the syllabus and modules of the 30 hours certificate courses for the session 2023-2024.

The details of the course module, syllabus and time table is submitted here with.

Hence please permit to run the add on courses and oblige me.

Thanking you

Yours sincerely

Dr. S. W. Anwane
Professor and Head
Department of Physics
Shri Shivaji Education Society Amravati's
SCIENCE COLLEGE
Congress Nagar, Nagpur.

Permitted

Shri Shivaji Education Society Amravati's

Science College

Congress Nagar, Nagpur

Department of Physics

Add-on Certificate Course (2023-2024)

Certificate Course: Advanced Ceramics and Composites

Notice

Date: 01/08/2023

The Department of Physics is conducting Add-on **Certificate Course on Advanced Ceramics and Composites** for the session 2023-24. Interesting students of M.Sc. Semester I & Semester III should register themself in early and contact to the Course Coordinator Dr. S. K. Sayyad immediately.

Course	Admission Fees
Advanced Ceramics and Composites	Free

Dr. S.K. Sayyad

Course Coordinator

Shri Shivaji Education Society Amravati's

Science College, Nagpur

Department Of Physics

Course Module and Syllabus

Certificate Course: Advanced Ceramics and Composites

Course Coordinator – Dr. Shahin K. Sayyad

Course Duration: 30 hours (spread over 10 weeks, 3 hours per week)[7/08/23-7/10/2023]

Course Overview: This certificate course provides participants with a comprehensive understanding of advanced ceramics and composites, covering their properties, fabrication methods, applications, and future prospects. Through a combination of lectures, case studies, and interactive discussions, participants will gain valuable insights into the latest developments in these materials and their significance in various industries.

Course Objectives:

- To provide a deep understanding of the structure, properties, and applications of advanced ceramics and composites.
- To develop skills in the synthesis and processing of ceramic and composite materials.
- To enable students to analyze the mechanical, thermal, and electrical properties of these materials.
- To explore current trends and advancements in ceramics and composites.
- To prepare students for research and industrial roles in material science focusing on ceramics and composites.

Course Outcomes:

By the end of the course, students will be able to:

- Understand the fundamental concepts and properties of advanced ceramics and composites.
- Synthesize and process various ceramic and composite materials.
- Analyze and interpret the properties of these materials.
- Apply ceramics and composites in real-world applications.
- Present and document their experimental findings effectively.

Duration of course: Ten weeks (30 Hours)

The Structure of Syllabus and system of evaluation -

Course	Theory Paper	Marks	
Certificate Course in **Advanced Ceramics and Composites**	Theory paper- Advanced Ceramics and Composites ***Theory examination will be of MCQ pattern having 40 questions each with equal marks.***	**Theory**	**Practical**
		80	**20**
		Total Marks 100	

Internal Quality Assurance Cell
(IQAC)
S. S. E. S. A. Science College
Congress Nagar, Nagpur

Dr. S. K. Sayyad
Course Co-ordinator

Principal
S. S. E. S. Amravati's
Science College, Nagpur.

Syllabus

Course Content:

Unit 1: Introduction to Ceramics and Composites

- Overview and classification of ceramics and composites
- Applications in various industries
- Key properties and advantages
- Ceramic powder synthesis
- Forming techniques (slip casting, tape casting, pressing)
- Sintering and densification processes

Unit 2: Synthesis and Processing of Composites

- Types of composite materials (metal matrix, polymer matrix, ceramic matrix)
- Fabrication techniques (lay-up, pultrusion, resin transfer molding)
- Interface and bonding mechanisms
- Strength, toughness, and hardness of ceramics and composites
- Fracture mechanics
- Wear and abrasion resistance

Unit III: Thermal ,Electrical and Magnetic Properties

- Thermal conductivity and expansion
- Thermal shock resistance
- High-temperature behavior
- Electrical conductivity and insulation
- Dielectric properties
- Magnetic ceramics and composites

Unit IV : Characterization Techniques

- Microscopy (SEM, TEM)
- Spectroscopy (EDS, Raman)
- Mechanical testing (hardness, tensile, impact)

Practical Demonstration Sessions

1. Synthesis of Materials using Sol-gel method.
2. Synthesis of Materials using Hydrothermal method.
3. Synthesis of Materials using coprecipitation method.
4. Synthesis of Materials using soft combustion method.
5. Identification of functional groups and chemical bonds in materials through analysis of infrared absorption spectra.
6. Elemental analysis of materials to determine their chemical composition using EDX
7. Investigation of molecular vibrations and crystal structures of materials through analysis of Raman scattering spectra.

Distribution of marks:-

Synthesis Method	(05 Marks)
Characterization Techniques	(05 Marks)
Common issues and diagnostics	(05 Marks)
Preventive maintenance	(05 Marks)

Week-wise teaching plan

Week	HRS.	Syllabus
Week1	**1**	Overview and classification of ceramics and composites
	1	Applications in various industries
	1	Key properties and advantages
Week 2	**1**	Ceramic powder synthesis
	1	Forming techniques (sol gel , Hydrothermal , Co-precipitation, Pallet formation)
	1	Sintering and densification processes
Week 3	**1**	Types of composite materials (metal matrix, polymer matrix, ceramic matrix)
	2	Fabrication techniques (Solution Casting)
Week 4	**2**	Practical :Synthesis of Materials using Sol-gel method.
	1	Practical : Synthesis of Materials using Hydrothermal method
Week 5	**2**	Practical : Synthesis of Materials using coprecipitation method.
	1	Interface and bonding mechanisms
Week 6	**1**	Strength, toughness, and hardness of ceramics and composites
	1	Fracture mechanics
	1	Wear and abrasion resistance
Week 7	**1**	Thermal conductivity and expansion
	1	Thermal shock resistance
	1	High-temperature behavior
Week 8	**1**	Electrical conductivity and insulation
	1	Dielectric properties

	1	Magnetic ceramics and composites
Week 9	**1**	Microscopy (SEM, TEM)
	1	Spectroscopy (EDS, Raman)
	1	Mechanical testing (hardness, tensile, impact)
Week 10	**1**	Identification of functional groups and chemical bonds in materials through analysis of infrared absorption spectra.
	1	Elemental analysis of materials to determine their chemical composition using EDX
	1	Investigation of molecular vibrations and crystal structures of materials through analysis of Raman scattering spectra.

SSES Amravati's

Science College, Congress Nagar, Nagpur-12

Session 2023-24

Certificate course (10 weeks)

(Advanced Ceramics and Composites)

Timetable

Sr. No.	Day	Theory
1	Friday	SKS (C4) Theory 4.00 PM – 5.00 PM
2	Saturday	SKS (C4) Theory, 4.00 PM – 5:00 PM
3		(Physics Lab) practical, 5.00 PM – 6.00 PM

Course Coordinator
Dr. S.K.Sayyad

Shri Shivaji Education Society Amravati's
Science College, Congress Nagar Nagpur
Department of Physics
Add-on Certificate course

Title: "Certificate Course: Advanced Ceramics and Composites"
Registration List of Students
2023-2024

Sr. No.	Name Of Students
1	Achal Mohurle
2	Premlata Uparikar
3	Prerna Ambade
4	Rahul Khangar
5	Riya Faldu
6	Sakshi Nale
7	Samiksha Bhusari
8	Vaishnavi Khade
9	Vedant Maske
10	Yash Chaube
11	Joy George Panakal
12	Mahevash Zamani Baig
13	Nakul Avinash Deogade
14	Nisha Yuvraj Shidurkar
15	Ranita Eknath Aglave
16	Sakshi Omprakash Ukey
17	Sakshit Janardhan Wahane
18	Shraddha Vishwas Raut

Course Coordinator
Dr. S.K.Sayyad

Shri Shivaji Educationsociety Amravati's

Science College,Congress Nagar, Nagpur

Certificate course on Advanced Ceramic and Composites

Theory Class Attendance Sheet

2023-2024

Sr. No	Students Full Name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Total
1	Achal Mohurle	P	P	P	P	-	P	P	P	-	P	P	-	-	P	P	P	P	P	P	P	P	P	-	P	P	P	P	P	P	P	25
2	Premlata Upurkar	P	-	P	P	P	P	P	P	-	P	P	P	P	P		P	P	P	-	P	P	P	P	P	P	-	P	P	P	P	25
3	Prerna Ambade	P	P	P	-	P	P	P	P	P		P	P	P	P	P	P	P	P	P	P	P	P	P	-	P	P	P	P	P	P	27
4	Rahul Khangar	-	-	P	P	P	P	P	P	P	P	P	P	P	-	P	-	P	P	P	P	-	P	P	P	P	P	P	P	-	P	25
5	Riya Faldu	P	P	P	-	P	P	P	P	P	P	P		P	P	P	P	P	P	P	P		P	P	P	P	P	P	P	P	P	27
6	Sakshi Nale	P	P	P	-	P	P	P	P	P	P	P	P	P	P	P	P	-	P	-	P	P	P	P	P	P	-	P	P	P	P	27
7	Samiksha Bhusari	P	P	P	P	P	P	P	P	P	-	P	P	P	P	P	-	P	P	P	P		-	P	P	P	P	-	P	P	P	26
8	Vaishnavi Khode	P	P	P	P	P	P	P	P	-	-	P	P	P	P	-	P	P	P	P	-	P	P	P	P	P	P	P	P	P	P	26
9	Vedant Moske	P	P	P	P	P	P	P	P	P	-	P	P	P	P	P	P	P	P	P	P	P	P	P	-	-	P	P	P	P	P	27
10	Yash Choube	P	P	P	-	P	-	P	-	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	-	P	P	26
11	Joy George Panakal	P	P	P	P	P	-	P	P	P	P	P	-	P	P	P	P	P	P	P	P	P	P	P	P	P	-	P	-	P	P	26
12	Mahevesh Zamani Baig	-	P	P	P	P	P	-	P	P	P	P	P	P	P	P	P	-	P	P	P	P	P	P	P	P	P	P	P	P	P	27
13	Nakul Avinash Deogade	P	P	P	P	P	P	P	P	P	-	-	P	P	P	P	P	P	P	P	-	P	P	P	P	P	P	P	P	P	P	28
14	Nisha Yuvraj Shidurkar	P	P	P	P	-	P	P	-	P	P	P	P	-	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	28
15	Ranita Eknath Aglave	P	P	P	P	P	P	P	P	P	P	-	-	P	P	P	P	P	P	P	P	P	P	P	P	P	-	-	P	P	P	26
16	Sakshi Omprakash Ukey	-	P	P	P	P	-	P	P	P	P	-	P	P	P	P	P	P	P	P	P	-	P	P	P	-	P	P	P	P	P	27
17	Sakshit Janardhan Wahane	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	-	-	P	P	P	P	P	P	P	P	P	P	28
18	Shraddha Vishwas Raut	P	P	P	P	P	P	P	P	P	P	-	-	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	28

Dr. S. K. Sayyad
Course Coordinator

Shri Shivaji Education Society Amravati's

Science College

Congress Nagar, Nagpur

Department of Physics

Add-on Certificate Course (2023-2024)

Certificate Course: Advanced Ceramics and Composites

NOTICE

Date:

All the registered students of add-on Course on **Advanced Ceramics and Composites** under Department of Physics for the session 2023-24 are hereby informed that the theory examination is to be scheduled on 28/10/2023 (Saturday) at 10:30 am to 11:30 am in Physics C4 room at our college centre. All Students should be present in the laboratory before 10 mins. of scheduled time of examination.

Dr. S.K.Sayyad
Course Coordinator
Department of Physics

Shri Shivaji Education Society Amravati's

Science College Congress Nagar Nagpur

Departrment Of Physics

Certificate course on Advanced Ceramic and Composites

Certificate Final Exam Attendance of Students

Date: **Time:**

Sr. No.	Name Of Students	Signature Of Students
1	Achal Mohurle	
2	Premlata Uparikar	
3	Prerna Ambade	
4	Rahul Khangar	
5	Riya Faldu	
6	Sakshi Nale	
7	Samiksha Bhusari	
8	Vaishnavi Khade	
9	Vedant Maske	
10	Yash Chaube	
11	Joy George Panakal	
12	Mahevash Zamani Baig	
13	Nakul Avinash Deogade	
14	Nisha Yuvraj Shidurkar	
15	Ranita Eknath Aglave	
16	Sakshi Omprakash Ukey	
17	Sakshit Janardhan Wahane	
18	Shraddha Vishwas Raut	

Course Coordinator
Dr. Shahin K. Sayyad
Assistant Professor
Dept. of Physics
SSESA'S Science College Nagpur

Shri Shivaji Education Society Amaravati's

Science College Congress Nagar, Nagpur

Department of Physics

Add-on Certificate Course on Advanced Ceramics and Composites

THEORY EXAM

Date: 29/10/2022 **Max. Time: 1 Hour**
Max. Marks: 80 **Marks Obtained:**

Student Name: ----------

Note: i) All questions are compulsory and carry equal marks
ii) Tick the correct option

Sign. Of Invigilator:

1. Which of the following is not a characteristic of advanced ceramics?

a) High melting point

b) Low hardness

c) Brittle

d) Chemically inert

2. What is the primary constituent of advanced ceramics?

a) Silica

b) Alumina

c) Titanium

d) Copper

3. What is the main advantage of using advanced ceramics over traditional materials?

a) Lower cost

b) Higher toughness

c) Corrosion resistance

d) High-temperature stability

4. Which of the following is not a method of producing advanced ceramics?

a) Sintering

b) Injection molding

c) Sol-gel processing

d) Extrusion

5. Which of the following is an example of a ceramic composite?

a) Silicon carbide

b) Zirconia

c) Glass-ceramics

d) Fiberglass

6. What is the primary reinforcement material in ceramic matrix composites (CMCs)?

a) Metal

b) Polymer

c) Ceramic fibers

d) Glass

7. Which of the following properties is typically improved in ceramic composites compared to monolithic ceramics?

a) Brittleness

b) Thermal conductivity

c) Strength

d) Transparency

8. What is the primary application of ceramic matrix composites (CMCs)?

a) Electronics

b) Aerospace

c) Construction

d) Automobile

9. What is the major advantage of using ceramic composites in aerospace applications?

a) Low cost

b) High ductility

c) Low weight

d) High electrical conductivity

10. Which of the following is not a type of ceramic composite?

a) Metal matrix composites

b) Polymer matrix composites

c) Ceramic matrix composites

d) Carbon matrix composites

11. What is the main limitation of using ceramic composites in high-temperature applications?

a) Low strength

b) High cost

c) Susceptibility to corrosion

d) Oxidation at high temperatures

12. Which of the following is a common fabrication method for ceramic matrix composites?

a) Powder metallurgy

b) Chemical vapor deposition

c) Polymer infusion

d) Rapid prototyping

13. What is the primary function of the matrix material in a ceramic composite?

a) Provide strength

b) Enhance ductility

c) Bind reinforcement

d) Increase thermal conductivity

14. Which of the following is not a type of ceramic matrix composite (CMC)?

    a) Carbon/carbon

    b) Oxide/oxide

    c) Silicon/silicon carbide

    d) Polymer/polymer

15. What is the primary reinforcement material in metal matrix composites (MMCs)?

    a) Ceramic fibers

    b) Metal fibers

    c) Polymer fibers

    d) Glass fibers

16. Which of the following is not a property of metal matrix composites (MMCs)?

    a) High strength

    b) Low density

    c) High thermal conductivity

    d) Corrosion resistance

17. Which of the following is not a common application of metal matrix composites (MMCs)?

    a) Automotive brake rotors

    b) Bicycle frames

    c) Aircraft fuselage

    d) Food packaging

18. What is the primary disadvantage of using metal matrix composites (MMCs) in aerospace applications?

    a) High cost

    b) High weight

    c) Low strength

    d) Poor machinability

19. What is the primary reinforcement material in polymer matrix composites (PMCs)?

a) Metal fibers

b) Ceramic fibers

c) Polymer fibers

d) Glass fibers

20. Which of the following is not a characteristic of polymer matrix composites (PMCs)?

a) High strength-to-weight ratio

b) Low electrical conductivity

c) High thermal conductivity

d) Corrosion resistance

21. What is the primary advantage of using polymer matrix composites (PMCs) in automotive applications?

a) Low cost

b) High strength

c) Corrosion resistance

d) Low weight

22. Which of the following is a common polymer matrix material used in composites?

a) Polyethylene

b) Aluminum

c) Steel

d) Copper

23. What is the primary reinforcement material in carbon matrix composites?

a) Metal fibers

b) Ceramic fibers

c) Polymer fibers

d) Carbon fibers

24. Which of the following is a common application of carbon matrix composites?

a) Aircraft engines

b) Food packaging

c) Bicycle frames

d) Clothing

25. What is the main advantage of using carbon matrix composites in high-temperature applications?

a) Low cost

b) High strength

c) Low weight

d) High thermal conductivity

26. Which of the following is not a limitation of ceramic matrix composites (CMCs)?

a) Susceptibility to oxidation

b) High cost

c) Low strength

d) Difficulty in fabrication

27. Which of the following is not a limitation of metal matrix composites (MMCs)?

a) High cost

b) High weight

c) Low strength

d) Poor machinability

28. Which of the following is not a limitation of polymer matrix composites (PMCs)?

a) Low strength

b) Low weight

c) Susceptibility to moisture

d) High thermal conductivity

29. Which of the following is not a limitation of carbon matrix composites?

a) High cost

b) Susceptibility to oxidation

c) Low strength

d) Low thermal conductivity

30. Which of the following is not a common reinforcement material used in composites?

a) Carbon fibers

b) Glass fibers

c) Steel fibers

d) Copper fibers

31. In which of the following applications, ceramic composites are typically used?

a) Thermal insulation

b) Structural components

c) Electrical wiring

d) Food packaging

32. Which of the following is not a method of fabricating ceramic composites?

a) Chemical vapor deposition

b) Injection molding

c) Powder metallurgy

d) Sol-gel processing

33. Which of the following is not a property of ceramic composites?

a) High strength

b) Low density

c) High electrical conductivity

d) High temperature stability

34. Which of the following is a limitation of using ceramic composites in aerospace applications?

a) High cost

b) Low strength

c) Low temperature stability

d) High density

35. Which of the following is not a type of ceramic matrix composite (CMC)?

a) Carbon/carbon

b) Oxide/oxide

c) Polymer/polymer

d) Silicon carbide/silicon carbide

36. Which of the following is not a common application of metal matrix composites (MMCs)?

a) Automotive brake rotors

b) Bicycle frames

c) Aircraft wings

d) Food packaging

37. Which of the following is not a property of polymer matrix composites (PMCs)?

a) High strength-to-weight ratio

b) Low electrical conductivity

c) High thermal conductivity

d) Corrosion resistance

38. Which of the following is a common reinforcement material used in polymer matrix composites (PMCs)?

a) Metal fibers

b) Ceramic fibers

c) Polymer fibers

d) Glass fibers

39. What is the main advantage of using carbon matrix composites in high-temperature applications?

a) Low cost

b) High strength

c) Low weight

d) High thermal conductivity

40. Which of the following is not a limitation of carbon matrix composites?

a) High cost

b) Susceptibility to oxidation

c) Low strength

d) Low thermal conductivity

Answer Key

1. Answer: b) Low hardness
2. Answer: b) Alumina
3. Answer: d) High-temperature stability
4. Answer: b) Injection molding
5. Answer: a) Silicon carbide
6. Answer: c) Ceramic fibers
7. Answer: c) Strength
8. Answer: b) Aerospace
9. Answer: c) Low weight
10. Answer: d) Carbon matrix composites
11. Answer: d) Oxidation at high temperatures
12. Answer: b) Chemical vapor deposition
13. Answer: c) Bind reinforcement
14. Answer: d) Polymer/polymer
15. Answer: a) Ceramic fibers
16. Answer: c) High thermal conductivity
17. Answer: d) Food packaging
18. Answer: b) High weight
19. Answer: d) Glass fibers
20. Answer: c) High thermal conductivity
21. Answer: d) Low weight
22. Answer: a) Polyethylene
23. Answer: d) Carbon fibers
24. Answer: a) Aircraft engines
25. Answer: b) High strength
26. Answer: c) Low strength
27. Answer: c) Low strength
28. Answer: d) High thermal conductivity
29. Answer: c) Low strength
30. Answer: d) Copper fibers
31. Answer: b) Structural components
32. Answer: b) Injection molding
33. Answer: c) High electrical conductivity
34. Answer: a) High cost
35. Answer: c) Polymer/polymer
36. Answer: d) Food packaging
37. Answer: c) High thermal conductivity
38. Answer: d) Glass fibers
39. Answer: b) High strength
40. Answer: d) Low thermal conductivity

Shri Shivaji Education Society, Amravati's

SCIENCE COLLEGE

Congress Nagar, Nagpur-12 (M.S.), India

Accredited with CGPA of 3.51 at 'A+' grade by NAAC, Bangalore
A "College with Potential for Excellence" identified by UGC New Delhi.
Institutional Member of APQN
Recognized Centre for Higher Learning and Research
Mentor College under 'PARAMARSH Scheme', UGC, New Delhi

Add-on Course

Course Exam Name: Certificate Course in Fundamentals of electronics
D. C. Power Supply

Name of Student: .....

Roll No.: | | | | **Session: 2023-24**

Test Date: 16/10/2023 | **Max. Marks: 80**

Invigilator Signature | **Obtained Marks:**

INSTRUCTIONS FOR FILLING THE SHEET
1. This sheet should not be folded or crushed.
2. Use only blue/ black ball point pen to fill the circles.
3. Use of pencil is strictly prohibited.
4. Circles should be darkened completely and properly.
5. Cutting and erasing on this sheet is not allowed.
6. Do not use any stray marks on the sheet.
7. Do not use marker or white fluid to hide the mark.

WRONG METHODS ⊗ ◉ ✓ CORRECT METHOD ○ ○ ○ ●

	A	B	C	D		A	B	C	D		A	B	C	D		A	B	C	D		A	B	C	D
1	○	○	○	○	11	○	○	○	○	21	○	○	○	○	31	○	○	○	○	41	○	○	○	○
2	○	○	○	○	12	○	○	○	○	22	○	○	○	○	32	○	○	○	○	42	○	○	○	○
3	○	○	○	○	13	○	○	○	○	23	○	○	○	○	33	○	○	○	○	43	○	○	○	○
4	○	○	○	○	14	○	○	○	○	24	○	○	○	○	34	○	○	○	○	44	○	○	○	○
5	○	○	○	○	15	○	○	○	○	25	○	○	○	○	35	○	○	○	○	45	○	○	○	○
6	○	○	○	○	16	○	○	○	○	26	○	○	○	○	36	○	○	○	○	46	○	○	○	○
7	○	○	○	○	17	○	○	○	○	27	○	○	○	○	37	○	○	○	○	47	○	○	○	○
8	○	○	○	○	18	○	○	○	○	28	○	○	○	○	38	○	○	○	○	48	○	○	○	○
9	○	○	○	○	19	○	○	○	○	29	○	○	○	○	39	○	○	○	○	49	○	○	○	○
10	○	○	○	○	20	○	○	○	○	30	○	○	○	○	40	○	○	○	○	50	○	○	○	○

Shri Shivaji Education Society Amravati's

Science College, Congress Nagar Nagpur

Department of Physics

2023-2024

Add-on course Examination

Title: "Certificate Course: Advanced Ceramics and composites"

Course Coordinator: Dr. S. K. Sayyad

DATE: **Total Marks: 100**

STATEMENT OF MARKS

Sr. No.	Name of Students	Theory Marks (80M)	Practical Marks (20M)	Total (100M)	Grade
1	Achal Mohurle	60	20	80	A
2	Premlata Uparikar	64	20	84	A
3	Prerna Ambade	70	20	90	A+
4	Rahul Khangar	64	18	82	A
5	Riya Faldu	66	20	86	A+
6	Sakshi Nale	74	20	94	A+
7	Samiksha Bhusari	58	20	78	A
8	Vaishnavi Khade	58	20	78	A
9	Vedant Maske	54	20	74	B+
10	Yash Chaube	74	18	92	A+
11	Joy George Panakal	64	16	80	A
12	Mahevash Zamani Baig	72	18	90	A+
13	Nakul Avinash Deogade	78	16	94	A+
14	Nisha Yuvraj Shidurkar	62	20	82	A
15	Ranita Eknath Aglave	58	20	78	A

16	Sakshi Omprakash Ukey	60	18	78	A
17	Sakshit Janardhan Wahane	70	16	86	A+
18	Shraddha Vishwas Raut	74	20	94	A+

Dr. S.K.Sayyad

Course Coordinator

Department of Physics

Shri Shivaji Education Society, Amravati's

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Mentor College under 'PARAMARSH Scheme', UGC, New Delhi

Add-on Course

Course Exam Name: Certificate course on Advanced Ceramic and Composites

Name of Student: Bhavna Ambade			
Roll No.: 003	**Session:** 2023-24		
Test Date: 28/10/2023	**Max. Marks:** 80		
Invigilator Signature	**Obtained Marks:**	70	

INSTRUCTIONS FOR FILLING THE SHEET
1. This sheet should not be folded or crushed.
2. Use only blue/ black ball point pen to fill the circles.
3. Use of pencil is strictly prohibited.
4. Circles should be darkened completely and properly.
5. Cutting and erasing on this sheet is not allowed.
6. Do not use any stray marks on the sheet.
7. Do not use marker or white fluid to hide the mark.

WRONG METHODS ⊗ ◉ ⊜ ✓ CORRECT METHOD ○ ○ ○ ●

	A	B	C	D
1	○	●	○	○
2	○	●	○	○
3	○	○	○	●
4	○	●	○	○
5	○	●	○	○
6	●	○	○	○
7	○	○	●	○
8	○	○	●	○
9	○	●	○	○
10	○	○	○	○
11	○	○	○	●
12	○	●	○	○
13	○	○	●	○
14	○	○	●	○
15	●	○	○	○
16	○	○	●	○
17	○	○	○	●
18	○	●	○	○
19	○	○	●	○
20	○	○	●	○
21	○	○	○	●
22	●	○	○	○
23	○	○	○	●
24	●	○	○	○
25	○	●	○	○
26	○	○	●	○
27	○	○	●	○
28	○	○	○	●
29	○	○	●	○
30	○	○	○	●
31	○	●	○	○
32	○	●	○	○
33	○	○	●	○
34	●	○	○	○
35	○	○	●	○
36	○	○	○	●
37	○	○	●	○
38	○	○	●	○
39	○	●	○	○
40	○	○	○	●
41	○	○	○	○
42	○	○	○	○
43	○	○	○	○
44	○	○	○	○
45	○	○	○	○
46	○	○	○	○
47	○	○	○	○
48	○	○	○	○
49	○	○	○	○
50	○	○	○	○

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Mentor College under 'PARAMARSH Scheme', UGC, New Delhi

Add-on Course

Course Exam Name: Certificate course on Advanced Ceramic and Composites

Name of Student: Achal Mahure

Roll No.: 0 0 1

Session: 2023-24

Test Date: 28/10/2023

Max. Marks: 80

Invigilator Signature

Obtained Marks: 60

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WRONG METHODS ⊗ ◉ ◉ ✓ CORRECT METHOD ○ ○ ○ ●

	A	B	C	D
1	○	●	○	○
2	○	●	○	○
3	○	○	○	●
4	○	○	●	○
5	●	○	○	○
6	○	○	○	●
7	○	○	●	○
8	●	○	○	○
9	○	○	○	●
10	○	○	○	●
11	○	○	○	●
12	○	●	○	○
13	○	○	○	●
14	○	○	○	●
15	●	○	○	○
16	○	○	●	○
17	○	○	●	○
18	○	●	○	○
19	○	○	●	○
20	○	○	●	○
21	○	●	○	○
22	●	○	○	○
23	○	○	○	●
24	●	○	○	○
25	○	○	●	○
26	○	○	●	○
27	○	○	○	●
28	○	○	○	●
29	○	○	●	○
30	○	○	●	○
31	○	●	○	○
32	○	○	●	○
33	○	○	●	○
34	●	○	○	○
35	○	○	●	○
36	○	○	●	○
37	○	○	●	○
38	○	○	○	●
39	○	●	○	○
40	○	○	●	○
41	○	○	○	○
42	○	○	○	○
43	○	○	○	○
44	○	○	○	○
45	○	○	○	○
46	○	○	○	○
47	○	○	○	○
48	○	○	○	○
49	○	○	○	○
50	○	○	○	○

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CERTIFICATE

Mr./Ku. _____ is awarded with certificate on successful completion of the course entitled, Certificate course in **"Advanced Ceramic & Composites"**.

Session 2023-24 under Add-on course conducted for **30 hours from 01/08/2023 to 07/10/2023** by Department of Physics, SSESA's, Science College, congress Nagar, Nagpur 440012.

He/She has passed the Examination with '__' Grade.

Dr. Mrs. Shahin Sayyed
Coordinator, Department of Physics

Prof. M. P. Dhore
Principal, Science College, Nag

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Mr./Ku. **Prerna Ambade** is awarded with certificate on successful completion of the course entitled, Certificate course in Advanced Ceramic and Composites.

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Dr. Shahin K. Sayyad
Coordinator, Department of

Prof. M. P. Dhore
Principal, Science Colleg

Shri Shivaji Education Society Amravati's

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Mr./Ku. Achal Mohurle is awarded with certificate on successful completion of the course entitled, Certificate course in Advanced Ceramic and Composites.

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He/She has passed the Examination with 'A' Grade.

Dr. Shahin K. Sayyad

Coordinator, Department of

Prof. M. P. Dhore

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