C–5222	Sub. Code
	82426

B.Voc. DEGREE EXAMINATION, NOVEMBER 2021

Second Semester

Foundry Technology

PHYSICAL METALLURGY OF CASTING

(2019 onwards)

Duration : 3 Hours   Maximum : 75 Marks

Part A   (10 × 2 = 20)

Answer **all** questions.

1.   Define alloying process.

2.   Draw an equilibrium diagram for solid solution.

3.   List the steps in casting process.

4.   What is homogeneous nucleation?

5.   Write the proper reason for diffusional transformation.

6.   Define grain structure.

7.   What is meant by segregation?

8.   How the residual stress affect the casting components?

9.   What is the purpose of metallography?

10.   How the specimens are prepared for metallography?

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Illustrate the various intermediate phases of alloying process.

Or

(b) Give short notes on inter metallic compound in metal alloying process.

12. (a) Draw and explain the cooling curve of solidification of pure metal.

Or

(b) Distinguish between homogeneous and heterogeneous nucleation growth.

13. (a) Illustrate and describe the ternary equilibrium diagram pure metal.

Or

(b) How microstructure property of material changes during the casting process?

14. (a) Describe in detail about the micro and macro porosity.

Or

(b) Elaborate the effect of residual stress in casted component.

15. (a) How metallography helps in understanding of structure of alloying component?

Or

(b) Explain the principle of electron microscope.

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Part C (3 × 10 = 30)

Answer **all** questions, choosing either (a) or (b).

16. (a) What is meant by solidification? Describe in detail about the solicitation process.

Or

(b) Draw and Interpret the points in binary equilibrium diagram.

17. (a) What are all the different factor that affect the solidification process? Explain it in detail.

Or

(b) Describe the strengthening mechanism of alloying element after solidification.

18. (a) Give short note following term

(i) cellular dendritic

(ii) multiphase microstructure.

Or

(b) Describe the concept of heterogeneous nucleation of solidification processes.

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		82436

B.Voc. DEGREE EXAMINATION, NOVEMBER 2021

Third Semester

Foundry Technology

HEAT TREATMENT TECHNOLOGY

(2019 onwards)

Duration : 3 Hours   Maximum : 75 Marks

Part A   (10 × 2 = 20)

Answer **all** questions.

1.   What is Hardening?

2.   Define Tempering.

3.   What is annealing?

4.   State any two non ferrous metals.

5.   What is alloy?

6.   Define Casting.

7.   What is Automation?

8.   Define Carburising.

9.   What is cast iron?

10.   Write a note on grain size.

Answer **all** questions, choosing either (a) or (b).

11. (a) Write short note on decomposition austenite.

    Or

    (b) Discuss about TTT and CCT curves.

12. (a) Write the merits of Electron beam hardening.

    Or

    (b) Write briefly about surface hardening.

13. (a) Discuss about Heat treatment of Weldments.

    Or

    (b) Write short note on High Temperature carburising.

14. (a) Write briefly bout Age — Hardening.

    Or

    (b) Write about Heat Treatment defects in forgings.

15. (a) Discuss the merits of automation.

    Or

    (b) Write about controlling Heat Treating furnace atmosphere.

Part C (3 × 10 = 30)

Answer **all** questions, choosing either (a) or (b).

16. (a) Elaborate on diffusion controlled and diffusion less transformation

    Or

    (b) Explain about pearlitic and bainitic transformation

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17. (a) Explain the application of plasma heat treating.

Or

(b) Explain the Heat Treatment of tool and alloy steels.

18. (a) Explain the Heat Treatment of non - ferrous metals and alloys.

Or

(b) Explain the Heat Treatment defects in castings, weldments and their remedial measures.

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