BIRLA INSTITUTE OF TECHNOLOGY
MESRA – 835215, RANCHI, INDIA

UG

Name: …… Roll No.: ……..

Branch: …… Signature of Invigilator: ……

Semester: IVth Date: 25/04/2022 (MORNING)

Subject with Code: PE204 MANUFACTURING PROCESSES - I

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: B.TECH **SEMESTER: VI**
BRANCH: PRODUCTION ENGG. **SESSION: SP/2022**

SUBJECT: PE204 MANUFACTURING PROCESSES I

TIME: 2 HOURS **FULL MARKS: 50**

INSTRUCTIONS:

1. The question paper consists of two parts (A & B).
2. Part A is of MCQ's carries 30 marks. Select one best possible alternative among the four. Each question carries 1 mark. No negative marking.
3. Before attempting the question paper, be sure that you have got the correct question paper and both the question paper parts.
4. The missing data, if any, may be assumed suitably.

PART A

Part A is of MCQ's carries 30 marks. ***Tick*** (√) the best possible alternative among the four. Each question carries 1 mark. No negative marking.

1. A Chaplet in sand casting

a	is metallic objects which are placed in the mould to increase the cooling rate of castings to provide uniform or desired cooling rate.	b	is used to support cores inside the mould cavity to take care of its own weight and overcome the metallostatic forces.	c	is a tool used in sand casting to manually cut the gate.	d	is used to create vent holes

2. Which of the following is true about riser?
i. It permits the molten metal to rise above the highest point in the casting.
ii. Filling up of mould cavity can be visually checked from it.
iii. The casting solidifies directionally towards the riser

a	i, ii & iii	b	i & ii	c	i & iii	d	Only iii

3. The defect known as 'drop' occurs when the upper surface of the mould cracks and pieces of sand fall into the molten metal. This defect occurs due to

a	low green strength	b	low mould hardness	c	insufficient reinforcement	d	any of the alternatives

4. Which of the following statement about gates is correct?

a	the size of gate depends upon the rate of solidification	b	all of the alternatives	c	More than one gate may be used to feed a fast-freezing casting	d	A gate should not have sharp edges

5. A misrun is which one of the following defects in casting:

a	"pipe" formation	b	metal is not properly poured into the down sprue	c	metal solidifies before filling the cavity	d	globules of metal becoming entrapped in the casting

6. Gating Ratio is

a	ratio of the volume of the gates to the sprue volume	b	ratio of all the gates	c	ratio of the volume of the gates to the runner volume.	d	ratio between the cross-sectional areas of the sprue, runners, and in-gates

7. A cylindrical part is to be cast out of aluminum. The radius of the cylinder r= 150 mm and its thickness h= 10 mm. If the mold constant Cm = 2.0 sec/mm^2 in Chvorinov's Rule, how long will it take the casting to solidify?

a	0.132 min	b	2.86 min	c	0.732 min	d	1.86 min

8. Which of the following casting processes is NOT an expendable mould operation?
a die casting b investment casting c sand casting d shell molding

9. Which of the following casting processes is NOT a permanent mould operation
a die casting b shell molding c continuous casting d centrifugal casting

10. Which of the following metals would typically be used in die casting?
a Aluminium b Steel c Cast iron d tungsten

11. In a hot chamber die casting machine
a None of the alternatives b It is used for high melting (above 500°C) alloys c No pressure is used for forcing the metal inside the die d melting unit is an integral part of the machine

12. No core is needed to form a hole in axis symmetrical components in
a die casting b Semi-permanent mould casting c centrifugal casting d sand casting

13. In which of the following process, in general, the metal is rapidly chilled to the point of solidification
a Continuous casting b Centrifugal casting c Investment casting d Die casting

14. Which of the following is the limitation of pressure die casting?
a Possible only for low melting temperature alloys b Only small parts can be produced c High initial investment d All the alternatives

15. Which of the following arc welding process uses a constant voltage power source?
a Submerged arc welding b Tungsten inert gas welding c Stud welding d Gas metal arc welding

16. The voltage-current characteristics of the constant current power source is
a sloping straight line b Exponentially rising c Drooping d Parabolic

17. Arc blow occurs in
a DC welding b AC welding c both DC & AC welding d none of the alternatives

18. In SMAW welding operations the diameter of the electrode is decided by
a The thickness of plate b The voltage across the arc c Open circuit voltage d Length of the welded portion

19. The Hot Start feature in SMAW welding operations
a supply an overcurrent every time welding restarts b increases the ease of starting electrodes c facilitates the striking of the electric arc d All the alternatives

20. The Anti-Stick feature in SMAW welding operations
a facilitates the striking of the electric arc b allows the stick welding electrode to be easily detached, if it does begin to stick c increases the ease of starting electrodes, especially in difficult conditions such as damp electrodes, imperfect job surface, or when using 'difficult to run' electrodes, etc. d supply an overcurrent every time welding restarts

21. Which of the following flame in gas welding is harmful to steel?
a Carburizing flame b Neutral flame c Oxidizing flame d Both oxidizing flame and carburizing flame

22. The heat generated (H) in resistance welding is expressed by
a IR^2t b I^2Rt c IRt^2 d 2IRT

23. Which process is used for repairing of railway tracks and spokes of driving wheels?
a Thermit welding b Electron beam welding c Plasma arc welding d Electroslag welding

24. Which process allows fusion welds of great depth with minimum width?

a	Plasma arc welding	b	Ultrasonic welding	c	Electron beam welding	d	Friction welding

25. The limitation of a liquid penetrant test is:

a	All of the listed alternatives are correct	b	Only surface breaking discontinuities can be detected if chemically and physically clean and dry	c	Porous materials cannot be tested	d	There is cleaning problem following penetrant inspection in some cases

26. Which of the following is **not** an advantage of magnetic particles testing?

a	Works well through a thin coat of paint	b	Fast and simple to perform	c	Can detect surface and sub surface discontinuities	d	Most reliable for finding surface cracks in all types of material

27. Which of the following statements is true for the ultrasonic test?

a	Equipment used for ultrasonic testing is portable	b	Complicated shapes can be easily scanned	c	Waves generated are health hazardous and complicated shapes can be easily scanned	d	Waves generated are health hazardous

28. Which of the following is not a bulk deformation process?

a	Extrusion	b	Deep Drawing	c	Rolling	d	Forging

29. As sheet-metal stock hardness increases in a blanking operation, the clearance between punch and die should be

a	Remain the same	b	Decreased	c	Does not matter	d	increased

30. Springback in a sheet-metal-bending operation is the result of which one of the following

a	Plastic recovery	b	elastic modulus of the metal	c	overbending	d	elastic recovery of the metal

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SUBJECT: PE204 MANUFACTURING PROCESSES I

TIME: 2 HOURS **FULL MARKS: 50**

INSTRUCTIONS:

1. The question paper consists of two parts (A & B).
2. Part B carries 20 marks. Answer any 10 questions of your choice. Each question carries 2 marks.
3. Before attempting the question paper, be sure that you have got the correct question paper and both the question paper parts.
4. The missing data, if any, may be assumed suitably.

PART B

Part B carries 20 marks. Answer any 10 questions of your choice. Each question carries 2 marks.

1. What is directional sonification?
2. Differentiate between sweep pattern and segmental pattern.
3. Explain how will you select a pattern material?
4. Explain how the permeability of moulding sand is affected by the sand size and moisture content.
5. Differentiate between the hot chamber and cold chamber die casting method.
6. Differentiate between semi centrifugal and centrifuging casting methods.
7. Explain how shell moulding is more advantageous than sand casting?
8. Discuss the basic principles of SMAW?
9. Differentiate between GMAW and GTAW.
10. Explain how SAW is an efficient welding technique?
11. Explain how in resistance welding, the maximum heat is generated between the workpieces junction at the point of load? How do you express the heat generated in the processes?
12. Explain the basic principles of liquid dye penetrant test.
13. Explain the conditions under which magnetic particle test will fail to detect the defect.
14. What is forging? Name some industrial products made by forging.
15. Differentiate between hot working and cold working.