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Code No. : 15560 N/O

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD

Accredited by NAAC with A++ Grade

B.E. (Mech. Engg.) V-Semester Main & Backlog Examinations, Jan./Feb.-2024**Manufacturing Processes**

Time: 3 hours

Max. Marks: 60

Note: Answer all questions from **Part-A** and any **FIVE** from **Part-B****Part-A (10 × 2 = 20 Marks)**

Q. No.	Stem of the question	M	L	CO	PO
1.	What are the desirable properties of moulding sand?	2	1	1	1
2.	What are the functions served by the pouring basin in a sand casting?	2	2	1	1
3.	What is meant by carbon dioxide moulding?	2	1	2	1
4.	Define Extrusion of plastics?	2	1	2	1
5.	Explain the effect of polarity on penetration in DC arc welding.	2	2	3	2
6.	Describe the difference between brazing and soldering	2	2	3	2
7.	What are the specific applications of thermit welding?	2	2	4	1
8.	What are the advantages of laser beam welding?	2	2	4	1
9.	Differentiate blanking and piercing?	2	2	5	1
10.	Define Engineering stress, strain and True stress, strain.	2	1	5	1
Part-B (5 × 8 = 40 Marks)					
11. a)	What is draft allowance? How is it provided for patterns?	4	2	1	2
b)	Calculate the optimum pouring time for a casting whose mass is 20 kg and having an average section thickness of 15 mm. The materials of the casting are grey cast iron and steel. Take the fluidity of iron as 28 inches.	4	4	1	4
12. a)	What are the possible casting defects that may be caused by the improper gating-system design? State at least four defects.	4	1	2	2
b)	Describe the thermoforming process. What are its applications?	4	3	2	4
13. a)	Calculate the melting efficiency in the case of arc welding of steel with a potential of 20 V and current of 200 A. The travel speed is 5 mm/s and the cross-sectional area of the joint is 20mm ² . Heat required to melt steel may be taken as 10 J/mm ³ and the heat transfer efficiency as 0.85.	4	4	3	4
b)	Explain the working principle of Ultrasonic metal welding with neat sketch.	4	3	3	2

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14. a)	Describe the electron beam welding process.	4	3	4	2
b)	In a resistance welding of a lap joint or two mild-steel sheets of 1.5 mm thickness, a current of 10000 A is passed for a period of 0.1 seconds. The effective resistance of the joint is 120 micro-ohms. Density of steel is 0.00786 g/mm ³ and heat required to melt is 1381 J/g. The joint can be considered as a cylinder of 5 mm diameter and 2.25 mm in height. Calculate the percentage of heat distributed to the surroundings.	4	4	4	4
15. a)	What are specific merits of cold working over hot working?	4	1	5	2
b)	Determine the die and punch sizes for blanking a circular disc of 20 mm diameter from a C20 steel sheet whose thickness is 1.5 mm and maximum shear strength can be taken as 294 MPa.	4	4	5	4
16. a)	Sketch the cross section of a sand mould which is ready for pouring and label the various important parts.	4	3	1	2
b)	Specify the advantages of precision investment casting process over other casting processes.	4	2	2	2
17.	Answer any <i>two</i> of the following:				
a)	Briefly explain the principle of rolling with a neat sketch.	4	2	3	4
b)	Explain the principle of atomic hydrogen welding.	4	2	4	4
c)	Differentiate between GMAW and GTAW.	4	2	5	2

M : Marks; L: Bloom's Taxonomy Level; CO; Course Outcome; PO: Programme Outcome

i)	Blooms Taxonomy Level – 1	20%
ii)	Blooms Taxonomy Level – 2	40%
iii)	Blooms Taxonomy Level – 3 & 4	40%
