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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

(SEM: THIRD, THEORY EXAMINATION(2022-2023)

Subject : Manufacturing Technology-I

Time: 3Hours  Max. Marks:100

General Instructions:

**IMP:** Verify that you have received question paper with correct course, code, branch etc.

1. *This Question paper comprises of three Sections -A, B, & C. It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.*
2. *Maximum marks for each question are indicated on right hand side of each question.*
3. *Illustrate your answers with neat sketches wherever necessary.*
4. *Assume suitable data if necessary.*
5. *Preferably, write the answers in sequential order.*
6. *No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.*

SECTION – A  20

1. Attempt all parts:-

1-a. Which of the following material can be used for making patterns? (CO1)  1

(a). Aluminum
(b). Wax
(c). Lead
(d). All of the above

1-b. Which of the following is used for making the hollow cavities in the casting? (CO1)  1

(a). Chaplet
(b). Vent rod
(c). Core
(d). Chill

1-c. The directional solidification in casting can be improved by using ……. (CO2)  1

(a). Shell moulding
(b). Permanent mould casting
(c). Hot-chamber die casting
(d). True centrifugal casting

1-d. In hot chamber method of die casting..... (CO2)  1

(a). The melting pot is integral with die casting machine
(b). The melting pot is separate from die casting machine
(c). Melting pot location has nothing to do with such a classification
(d). High temperature and low pressure alloys are used

1-e. Which of the following manufacturing processes is mainly considered for producing the components of very high strength? (CO3) 1

(a). Casting
(b). Forging
(c). Extrusion
(d). Rolling

1-f. Which of the following metal forming processes is best suitable for making the wires? (CO3) 1

(a). Forging
(b). Extrusion
(c). Drawing
(d). Rolling

1-g. Which of the following is the application of powder metallurgy? (CO4) 1

(a). Create unique materials with specific qualities that are impossible to accomplish using melting or shaping
(b). Create unique materials with specific qualities that are possible to accomplish using melting or shaping
(c). All of the mentioned
(d). None of the mentioned

1-h. Which of the following is typically the most expensive type of 3D printer? (CO4) 1

(a). SLA
(b). SLM
(c). FDM
(d). None of the above

1-i. Maximum flame temperature in case of gas welding occurs at … (CO5) 1

(a). at the tip of the flame
(b). at the tip of the torch
(c). inner cone
(d). next to the inner cone

1-j. The following welding process has greater directional stability due to the passage of arc through a copper orifice is…(CO5) 1

(a). Oxy-acetylene welding
(b). Plasma arc welding
(c). Gas metal arc welding
(d). Gas tungsten arc welding

2. Attempt all parts:-

2.a. Define the Pattern allowance. (CO1) 2

2.b. Why are aluminium alloys preferably cast in cold chamber die casting machines? (CO2) 2

2.c. What are the advantages of forging? (CO3) 2

2.d. What is difference between blanking and punching? (CO4) 2

2.e. List the types of filler materials and fluxes used in gas welding? (CO5) 2

SECTION – B

3. Answer any <u>five</u> of the following-

3-a. Explain four desirable properties of moulding sand. (CO1) 6

3-b. List out the defects in casting process. Explain any five with neat sketch (CO1) 6

3-c. With a neat and labelled sketch, analyse the steps in Shell moulding process. List 6

advantages and application of the process. (CO2)

3-d. Explain the principle of investment casting with necessary sketches. (CO2) 6

3-e. Drive the expression for drawings stress $\sigma_{xa}$ for wire drawing through a conical die of die angle $2\alpha$ and coefficient of friction is $\mu$ as 6

$$\frac{\sigma_{xa}}{2k} = \frac{1+B}{B}\left[1-\left(\frac{D_a}{D_b}\right)^{2B}\right]$$ (CO3)

3-f. Explain with a neat sketch the working principle of Selective Laser Sintering process. (CO4) 6

3-g. Define polarity in arc welding. How does it affect welding? How and why heat generated at electrode and workpiece vary according to polarity? (CO5) 6

SECTION – C

4. Answer any <u>one</u> of the following-

4-a. Classify the types of cores? Explain them with the help of sketches specifying their common applications. (CO1) 10

4-b. Classify and discuss the various types of molding sand. What are the main factors which influence the selection of particular molding sand for a specific use? (CO1) 10

5. Answer any <u>one</u> of the following-

5-a. Describe briefly with neat sketches all the process of extrusions. (CO3) 10

5-b. Explain hot rolling and various type of rolling mills used in hot rolling. (CO3) 10

6. Answer any <u>one</u> of the following-

6-a. Describe the process of centrifugal casting with neat sketch. What are the advantages? (CO2) 10

6-b. What is Die Casting, Explain its types and Application. (CO2) 10

7. Answer any <u>one</u> of the following-

7-a. Explain the working principle of submerged arc welding process with neat sketch; also write any two advantages and two disadvantages of the submerged arc welding process. (CO5) 10

7-b. With the help of neat diagrams illustrate the following: (CO5) 10
(i) Atomic Hydrogen welding
(ii) Resistance Spot Welding

8. Answer any <u>one</u> of the following-

8-a. Explain in detail post processing of additive manufacturing parts. (CO4) 10

8-b. With neat sketches illustrate the following: (CO4) 10
(i) Deep Drawing process
(ii) Ruber Forming