(74) SEAT No._____ **No. of Printed pages: 2**

**SARDAR PATEL UNIVERSITY**

***M.Sc. 1st Semester (Surface Coating Technology) Examination (CBCS)***

**Friday, November 10, 2017**

**Time: 10:00 am to 1:00 pm**

**Course No. : PS01ESCT22**

***Subject:* Fundamentals Mechanical Engineering for Coating Technologists**

**Total Marks: 70**

*N.B. (1) Marks allotted to the question are on its RHS*
*(2) Illustrate your answers wherever necessary with the help of neat sketches & chemical equations*

**Choose the correct answer from the following**

Q.1. 1 The property of a material to absorb energy and plastically deform without fracturing is called (1)
(A) Ductility (B) Hardness
(C) Malleability (D) Toughness

2 A machining process in which material is removed by the action of hard abrasive particles (1)
(A) Foundry process (B) Abrasive machining process
(C) Forging process (D) Powder metallurgy

3 The gears used to transmit power between two perpendicular & non-intersecting shafts (1)
(A) Spur Gear (B) Helical Gear
(C) Bevel Gear (D) Worm Gear

4 Small components of complex shape and difficult to machine are can be manufactured by (1)
(A) Powder metallurgy (B) Forming process
(C) Drawing process (D) Extrusion process

5 A manufacturing process to make complicated shapes is called (1)
(A) Forging process (B) Casting process
(C) Welding process (D) Forming process

6 Clutch is used to (1)
(A) Modify motion of shafts (B) Permanent Joining of shafts
(C) Transmit motion from driving to driven shaft according to need (D) Braking action of shafts

7 The nozzles are used to (1)
(A) Control fluid flow (B) Reduce fluid flow
(C) direct or modify the flow of a fluid (D) increase fluid flow

8 The technique to seal the gap formed between a rotary shaft and a stationary stuffing box is (1)
(A) Mechanical seal (B) Riveted joints
(C) Packing (D) Gasket

Q.2 **Attempt *any Seven* Questions:** (14)

(a) Define these mechanical properties: Brittleness and Elasticity.
(b) What is tail stock in a lathe? What are its functions?
(c) What are the characteristics of ceramic materials?
(d) Compare between flat belt and V belt drive.
(e) What is Grinding operation? Why it is considered as finishing operation?
(f) Define Mechanical seal. What is its function?
(g) Brief the types of sand binders in casting process? What is its role in molding sand?
(h) What is hydraulic press? What are the applications of it?
(i) Explain various die bending operations in sheet metal forming process.

(P.T.O.)

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| Q.3 a | Compare all characteristics of Belt drive and Chain drive transmission. | (6) |
| Q.3 b | What is the function of clutch? Draw line diagram of disk type clutch. | (6) |

**OR**

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|---|---|---|
| Q.3 a | Show line diagrams of straight turning, taper turning, facing, and drilling operations on lathe machine, showing direction of speed, feed and depth of cut. | (6) |
| Q.3 b | What are the characteristics of gear drive transmission? (Advantages, disadvantages & applications) | (6) |
| Q.4 a | What are the properties of moulding sand in foundry process? Explain any two. | (6) |
| Q.4 b | Compare major characteristics between two basic metal working processes; Cold working and Hot working process. | (6) |

**OR**

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|---|---|---|
| Q.4 a | Explain with sketch: Shrinkage allowance and Machining allowances given on pattern. | (6) |
| Q.4 b | Explain metal forging process with its advantages and limitations. | (6) |
| Q.5 a | Explain stepwise process of Powder metallurgy. Also draw block diagram. | (6) |
| Q.5 b | What are the advantages and disadvantages of welded joint? | (6) |

**OR**

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|---|---|---|
| Q.5 a | What is airless spraying? What are the advantages of it? | (6) |
| Q.5 b | Brief various sheet metal operations with diagram.. | (6) |
| Q.6 a | Compare working characteristics of hydraulic systems versus pneumatic systems. | (6) |
| Q.6 b | Draw line diagram of spraying gun with labeling of all components. Brief about its working. | (6) |

**OR**

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| Q.6 b | What are the advantages, disadvantages and safety precautions required for using Robots? | (6) |

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