

Seat No.: _____

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SARDAR PATEL UNIVERSITY

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

Saturday, October 29, 2016

Time: 10:00 am to 1:00 pm

Course No.: PS01ESCT02

Subject: Fundamental Mechanical Engineering for Coating Technologies

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

- Q.1 Choose the correct option. (1)
- (1) The property of a material to resist impact load is known as (1)
 A. Ductility B. Hardness
 C. Malleability D. Toughness
- (2) Gear pair used for connecting two perpendicular shaft with intersecting axis is (1)
 A. Spur Gears B. Helical Gears
 C. Bevel Gears D. Worm Gears
- (3) Operation to produce large number of holes in sheet metal is (1)
 A. Coining B. Lancing
 C. Punching D. Trimming
- (4) Complicated shape can be easily produced by (1)
 A. Welding process B. Casting process
 C. Rolling process D. Machining process
- (5) An operation of reducing diameter of work piece is called (1)
 A. Facing B. Turning
 C. Milling D. Drilling
- (6) Cold working of metal increases (1)
 A. Tensile strength B. Yield strength
 C. Hardness D. All of these
- (7) Which type of task can be carried out by Robots? (1)
 A. Simple and repetitive B. Difficult and repetitive
 C. Simple and variable D. Difficult and variable
- (8) Which of the following is a model or replica of the object to be cast? (1)
 A. Mould B. Patten
 C. Core D. Gating system
- Q.2 Answer any seven of the following (14)
- 1 Define: (i) Potential Energy (ii) Kinetic Energy
 - 2 Define: (i) Strength (ii) Toughness
 - 3 Differentiate between cast iron and steel materials.
 - 4 What is the function of these elements in transmission of motion? (i) shaft (ii) bearing
 - 5 What are the advantages of gear drive over belt drive?
 - 6 Define welding process. What are the benefits of welding process relative to riveted joints?
 - 7 What are the functions of chuck in lathe?
 - 8 Explain: Sand binders.
 - 9 Explain these machining operations: (i) Drilling, (ii) Slotting

- Q.3(a) Show with free hand sketches any four operations performed on lathe machine, showing direction of speed, feed and depth of cut. (6)
- (b) What is Powder metallurgy process? Write advantages, limitations and applications of this process. (6)

OR

- (b) Explain briefly Blanking, Punching and Bending sheet metal operations with the help of neat sketch. (6)
- Q.4(a) Explain the stepwise procedure of casting manufacturing process. Support your answer with the help of neat sketches. (6)
- (b) Briefly explain the important properties of moulding sand. (6)

OR

- (b) What is pattern allowance? Explain shrinkage allowance and machining allowance. (6)
- Q.5(a) What are the main components of hydraulic systems? Explain them briefly. (6)
- (b) Compare between hot working and cold working processes. (6)

OR

- (b) Compare working of hydraulic and pneumatic systems. (6)
- Q.6(a) Why robots are used in engineering applications? Name five applications of robots. (6)
- (b) What is hot spraying? What are the benefits of using hot spraying? (6)

OR

- (b) What is coupling? Briefly explain flange type of coupling. (6)

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