

GANPAT UNIVERSITY
M. Tech. (CAD/CAM) Sem. II Mechanical Engineering
CBCS Regular Examination April-June 2017
3ME212 – Advanced Machine Design - II

[Time: 3 Hour]

[Total Marks: 70]

Instructions:

- (1) Attempt all questions.
- (2) Figures to the right indicate full marks.
- (3) Assume suitable data if necessary.
- (4) Only scientific calculator is allowed.
- (5) Write Section – I and Section – II in separate answer book.

SECTION - I**Que. 1**

- (a) Show the morphology of the design process as per Asimow's model with neat sketch and explain the phases related to production consumption cycle in detail. [5]
- (b) Explain the characteristics of successful product development and also explain challenges faces while development of product. [5]

OR**Que. 1**

- (a) Explain Kano model for customer satisfaction with suitable sketch. Enlist the steps of establishing the target specifications process. [5]
- (b) Define brainstorming. Explain the set of rules for brainstorming session. [5]

Que. 2

- (a) Explain the objectives of lubrication. Explain different types of lubrication in detail. [5]
- (b) The following data is given for a hydrostatic thrust bearing: [6]
 Shaft speed = 720 rpm, supply pressure = 5 MPa, shaft diameter = 400 mm, recess diameter = 250 mm, film thickness = 0.15 mm, viscosity of lubricant = 30 cP, specific heat of lubricant = 1.76 kJ/kg° C, and specific gravity of lubricant = 0.86, calculate: (i) load carrying capacity of the bearing, (ii) flow required in lit/min, (iii) frictional power loss, (iv) pumping power loss, and (v) temperature rise.

Assume that the total power loss in the bearing is converted into frictional heat.

OR**Que. 2**

- (a) Derive the equation for the coefficient of friction due to free rolling. Write your assumptions clearly. [5]
- (b) Explain the contact of rough surfaces with neat sketches for deformation of asperities due to elastic and plastic deformation. [6]

Que. 3

- Attempt any three.** [9]
- (a) Explain the role of profit and competitiveness in economic analysis of product design.
- (b) Explain design of display with neat sketch and types of display related to ergonomics in product design.
- (c) Explain different product strategies in detail.
- (d) Describe the various factors affecting the wear behavior. State the methods for elimination of wear for each mechanism.

SECTION - II

- Que. 4 State and explain salient DFM aspect of any manufacturing processes. [5]
(a) [5]
(b) Explain design for forging with proper sketch.
OR
- Que. 4 Describe the design for machining in detail. [5]
(a) [5]
(b) What do you understand by DFM? State and explain general guide lines of DFM.
- Que. 5 Explain construction detail of belt conveyors. [5]
(a) [5]
(b) Elaborate essential requirements of a good material handling system.
OR
- Que. 5 Classify material handling equipment. [5]
(a) [5]
(b) Illustrate different methods of packaging of unit load.
- Que. 6 Enlist different principles of material handling. Explain standardization and flexibility principles in detail. [10]
(a) [10]
(b) Discuss different aspects in design and selection of belt conveyor.

*****END OF PAPER*****