Registration No :

Total Number of Pages : 02

M.Tech

P2MDCC05

2nd Semester Regular Examination 2018-19

BASIC MECHANICAL HANDLING SYSTEM

BRANCH : MACHINE DESIGN

Max Marks : 100

Time : 3 Hours

Q.CODE : F295

Answer Question No.1 (Part-1) which is compulsory, any EIGHT from Part-II and any TWO from Part-III.

The figures in the right hand margin indicate marks.

Part- I

Q1   **Only Short Answer Type Questions (Answer All-10)**   **(2 x 10)**

     a)   Differentiate between electric hoist and mechanical hoist.

     b)   What is sprocket? What is its use?

     c)   What are the advantages of Ramshorn hook?

     d)   Write the advantages and limitations of using steel wire ropes in a hoisting machine?

     e)   How to fastening the ends of steel wire ropes?

     f)   What is arresting gears?

     g)   Which surface of a crane hook is subjected to maximum stress? Explain.

     h)   What is Ribbon conveyor?

     i)   What is the difference between traction and traction less type of conveyors? Give examples.

     j)   What is a gantry crane?

Part- II

Q2   **Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve)**   **(6 x 8)**

     a)   Classify mechanical handling equipments.

     b)   What are the economic factors of material handling system?

     c)   Explain why material handling is very important in production?

     d)   Describe material handling at workplace. How a workplace layout should be planned?

     e)   Suggest handling equipment for a brake drum weighing 50 kg in continuous production.

     f)   Write a brief notes on design of ratchet pawls?

     g)   State the function of turn tables and capstans and explain their working.

     h)   Explain the rail travelling mechanism.

     i)   Describe construction of a winch.

     j)   Differentiate between electric hoist and mechanical hoist.

     k)   Describe working of spur geared hoist with sketch.

     l)   Explain the Bucket elevators.

Part-III

Only Long Answer Type Questions (Answer Any Two out of Four)

Q3   Select a wire rope for a vertical mine hoist to lift a load of 55 kN from a depth **(16)**
300 metres. A rope speed of 500 metres / min is to be attained in 10 seconds.

Q4   Determine the required power rating of the motors of an electric overhead travelling **(16)**
crane for the assembly shop of an engineering plant. Given : Lifting capacity, Q=5,500
kb, Span, Lcr=14 m. Load lifting (or lowering) speed, v-load=10 m/min, trolley traverse
speed, v-trol= 45 m.min, crane travelling speed vcr =100 m/min, power supply-three-
phase, 380 v, duty medium (DF=25 per cent)

Q5   Design a chain drive to run a blower at 600 r.p.m. The power to the blower is available **(16)**
from a 8 kW motor at 1500 r.p.m. The centre distance is to be kept at 800 mm

Q6   A pulley of 0.9 m diameter revolving at 200 r.p.m. is to transmit 7.5 kW. Find the width of **(16)**
a leather belt if the maximum tension is not to exceed 145 N in 10 mm width. The
tension in the tight side is twice that in the slack side. Determine the diameter of the
shaft and the dimensions of the various parts of the pulley, assuming it to have six arms.
Maximum shear stress is not to exceed 63 MPa.