Model (1)

Equipment for construction

Code: CMM 506

<u>Syllabus</u>

1. Explain the following types of heavy construction equipment:-

(a) Excavators   (b) Backhoe
(c-) Dragline Excavator   (d) Bulldozers
(e) Graders   (f) Wheel Tractor Scraper
(g) Trenchers   (h) Loaders

2. Write down short notes about:-
(a)-tractor Chassis   (b) Camber   (c-) Kingpin inclination

3. Explain the following systems:-

   (a) Power steering   (b) Hydraulic brake system

4. A truck whose max. G.V. W. is 8900 k_g is fitted with an engine which gave the following characteristics when tested at full throttle.

n_e, r.p.m	500	1000	1500	2000	2500	3000	3500	4000
N_e, Hp	18	38	57	74	88	102	103	97

Assuming the transmission ratio (ξ_{Tr}) is 0.85 and the rolling resistance factor is 1 % of the vehicle weight and the coefficient of air resistance is 0.052 when v in m/s and area in m^2. The frontal area is 6 m^2 the wheel diameter is such the wheels make 380 revolutions per kilometer travelled. The truck is supported to have a maximum speed of 85 km/hr when fully loaded on direct drive. Determine the back axle ratio and hence determine the maximum grade ability of the truck.

Model (2)

Equipment for construction

Code: CMM 506

1. The following types of heavy equipment commonly used in the construction, write short notes about the following equipment.

   (a) Tower Cranes   (b) Pavers

   (c-) Compactors   (d)Telehandlers

   (e) Feller Bunchers   (f) Dump Trucks

   (g) Pile Boring Machine   (h) Pile Driving Machine

2. Write short notes about the following terms;
   - (a) Caster   (b) Toe-in
   - (c) Factors affecting the selection of Equipment type
   - (d) Air brake system

3. Explain the steering systems and drive train used for vehicles

4. .Find the external characteristics of a truck engine if a desiel engine is used having maximum power, N_{max} = 103 Hp and n_{emax}=3500 r.p.m.

5. The beginning of the brake time (t_0) is 0.19 s, the speed of passenger car (V_0) is 80 km/hr. The rise of the slowdown during the compression brake time (t_1) is 0.36 s. Maximum deceleration required (a_m) is 0.7 m/s^2. Determaine:-
   - (a) Braking efficiency (ζ_B)   (b) Stopping distance, S