

- 3 (a) Explain the functioning of each part of "power shovel" 10
with neat sketch. Also, discuss its uses.

OR

- (a) Explain the functioning of each part of "Bull Dozer" 10
with neat sketch. Discuss its suitability.
- (b) Explain briefly the effect of following on the rolling 10
resistance :
- (i) Nature of tyre.
 - (ii) Nature of surface.
 - (iii) Grade.
 - (iv) Attitude.
 - (v) Temperature.

- 4 Answer in one sentence : 5

- (1) Give any two advantages of timber pile.
- (2) Write the use of anchor piles.
- (3) Name any two types of cast-in-situ piles.
- (4) Name any two types of explosives used in tunnelling.
- (5) Write two advantages of tunnelling.

- 5 (a) Discuss in which situation cast-in-situ piles construction 8
are preferred. Discuss the stages of its casting.
- (b) In which situation composite piles are used ? Discuss 7
advantages and disadvantages of pre-cast piles.

OR

- (b) Describe various types of steel piles, giving sketch with
their advantages and disadvantages.

- 6** Attempt any **three** : **18**
- (i) Sketch pile driving rig and explain the merits and demerits of drop hammer.
 - (ii) What are the different types of drilling equipments used in construction of tunnels ?
 - (iii) Give classification of tunnels in detail.
 - (iv) Give classification of piles, sketch and explain the uses of timber pile.
- 7** Write short notes : (any three) **12**
- (i) Tunnel lining.
 - (ii) Tunnel economics.
 - (iii) Tunnelling in loose soils.
 - (iv) Pile load test.
 - (v) Use of blasting techniques in tunnel.
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