

CS/B.Tech/Even/AUE/8th Sem/AUE-802A/2014

2014

Off Road Vehicle

Time Alloted : 3 Hours

Full Marks : 70

*The figure in the margin indicate full marks.  
Candidates are required to give their answers in their  
own words as far as practicable*

GROUP - A

( Multiple Choice Type Questions )

1. Choose the correct alternative from the following:

10x1=10

- i) Marching of dragline is done in-
  - a) Forward direction only
  - b) Backward direction only.
  - c) Sidewise direction only
  - d) None of these.
- ii) Fair lead pulley is a part of
  - a) Shovel
  - b) Dozer
  - c) Dragline
  - d) Dumper
- iii) During operation of shovel, the boom is inclined at-
  - a) 30° to the horizontal
  - b) 45° to the horizontal
  - c) 60° to the horizontal
  - d) any angle to the horizontal
- iv) Overload clutch is used in electric shovel for-
  - a) Hoist mechanism
  - b) Swing mechanism
  - c) travel mechanism
  - d) crowd mechanism

1

[ Turn over ]

- v) Dragline is specified by
  - a) Bucket capacity only
  - b) Boom capacity only
  - c) Power capacity or prime mover
  - d) Both (a) and (b)

- vi) Overinflation in dumper tyre causes
  - a) wear at the side
  - b) wear at the center
  - c) distortion wheel
  - d) all of these

- vii) Dumper uses
  - a) Coil suspension system
  - b) Leaf spring suspension system
  - c) Hydro air suspension system
  - d) Both (b) and (c)

viii) Road graders are mounted on-

- a) Crawler mechanism.
- b) Wheel assembly
- c) Rail
- d) Wagon.

ix) Angle Dozer

- a) Push arm length is kept constant. But pitch arm length is changed
- b) Both push arm and pitch arm lengths are kept constant
- c) Push arm length is changed but pitch arm length is kept constant
- d) Both push arm and pitch arm lengths are changed,

x) Retarder is used in dumper-

- a) To increases the load on brake system
- b) To decreases the load on brake system
- c) It does not affect the brake system
- d) It supplements the brake system

CS/B Tech/Even/AUE/8th Sem/AUE-802A/2014

**GROUP - E****( Short Answer Type Questions )**

Answer any three of the following

3x5=15

A dragline having specification 15/70 operating in a coal field under the following conditions

Shift 3 shift per day, 350 days in a year, Average utilization 80%, Cycle time 1 min, Bucket fill factor 0.75, Assumed

Annual production capacity of the dragline

As to handle 10,000 m<sup>3</sup> of soil on level ground would be the dimensions of the blade, if length to height ratio 1:0.43.

4. Draw the sketch of a dragline bucket and indicate different attachments.
5. Draw the kinematic diagram of dozer transmission system and explain its function.
6. Obtain the equation of annual capacity of shovel. Comment how you can increase the capacity.

**GROUP - C****( Long Answer Type Questions )**

Answer any three of the following.

3x15=45

7. A diesel shovel having following particular used in a project-

Bucket capacity 1.91M <sup>3</sup>	Cycle time 22 Sec.
Bucket fill factor 0.75	Swell factor 1.25
Average life 10yrs	Fuel consumption 28 lit/hr
Lubrication cost 25% of fuel cost	Repair cost 80% of depreciation cost
Purchase price Rs. 1.00 Core	Bank interest 15%
Insurance cost Rs. 2.0 lakhs per year	Operator's salary Rs. 30,000 per month
Fuel cost Rs. 58/ lit.	

CS/B.Tech/Even/AUE/8th Sem/AUE-802A/2014

Assume any other missing data.

Calculate the cost per M<sup>3</sup> of the material.

8. Draw the deck layout of a dragline and explain the different functions.
9. A dozer blade having dimension 4315 mm x 1875 mm operates on level ground. The average speed of dozer is 10KMPH. If the materials are to be shifted over a distance of 50 m. what would be the output of dozer? Assume the cutting of the material should be limited to 30 m length only. Assume any reasonable assumptions. Show by drawing your work plan.
10. Explain with neat sketch the hydraulic control circuit used in electric shovel. Discuss the purpose of this control.
11. Write short notes on any two
  - a) Grader hydraulic circuit
  - b) Pneumatic control of Electric shovel
  - c) Swing mechanism of Diesel shovel

http://www.makaut.com

http://www.makaut.com