UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination – May, 2018

Program/course: B.TECH/ MINING ENGG **Semester – IV**
Subject: MINE MACHINERY **Max. Marks : 100**
Code : MIEG 223 **Duration : 3 Hrs**
No. of page/s: 03

Instructions:

a. Answers must carry the supporting material such as equations and diagrams, wherever necessary
b. Section-A is compulsory
c. In section-B, attempt any 1 from Q-4
d. Section C is compulsory

Section A **20Marks.**

1.

i) Why patenting is essential for winding & haulage (5 marks)

ii) Discuss the maneuvering of Edge & apron in scrapper (5 marks)

iii) Why middle drum configured CSM is preferred over rest two? (5 marks)

iv) Identify the vulnerable points where recapping needs to be done. (5 marks)

Section B **40 Marks**

2. Discuss the factors influencing the FoS of wire rope (10 marks)

3. Each question carries 02 mark (02*10=20 marks)

a) What is the relation between rope diameter & drum dia?

b) What should be length of tail rope in endless haulage?

c) What is the fundamental difference between direct & gravity haulage

d) Which are the best locations where compressed air can be used & why?

e) What is the difference between tandem cage & single cage w.r.to attachment?

f) Describe the significance of Automatic contrivance. Does it have any relation with depth?

g) What alternate lay stands for?

h) What happens in acceleration period of winder?

i) Discuss the statutory provision for recapping

j) What is the composition of white metal used for capping?

4. Discuss the factors need to be considered while designing the best suited transportation system in u/g mine. Analyse the importance of each in brief (10 marks)

   OR

   Briefly discuss the distance specifications for headgear, pulley, decking level & the sequence of various safety attachments meant foe cage (10 marks)

Section C **40 Marks**
Each question carries 20 Marks

5. Design the process to convert wire rope from steel rod. Systematically illustrate the procedure to use Reliance Capel in rope.

6. a) Analyze the condition of super elevation in rail transport system. With the given set of information: locomotive travels around a curve of 40m radius at a speed of 40kmph, Gauge is 1 mtr, find out the super elevation (10 marks)

   b) With neat sketch, demonstrate the working concept of main & tail rope haulage (10 marks)

   Or

   What are the four types of torques required during winding cycle & how they are categorized. Basing on the given database, find out the torque during
   i) acceleration & retardation period
   ii) Friction Torque

GIVEN—

- Hoist per wind = 5tons
- No. of mine cars used=3
- Capacity of each Mine car= 0.35tons
- Each cage is single deck in nature
- Depth of shaft= 480 mtrs
- Acceleration & Retardation period= 10 secs each, constant speed=30 secs
- Drum dia= 4.2mtrs
- Weight of winding ropes=5.9kgf/mtrs
- Weight of cage (including suspension gear)= 5tons
- Force exerted due to friction =1/16 th of weight of cage (including content)

Roll No: ----------