

Roll No: -----

UNIVERSITY OF PETROLEUM & ENERGY STUDIES

DEHRADUN

End Semester Examination – December, 2017

Program/course: B.Tech/ FSE

Subject: Safety in rail and road transport

Code :FSEG 411

No. of page/s:



Max. Marks : 100

Duration : 3 Hrs

Section A - Answer all Questions

(4 x 5= 20 Marks)

1. Explain the layout of marshalling yard.
2. Explain the Automatic train control system
3. Explain Lag distance in with an Example.
4. Mention the steps followed in calculation of Super elevation in Highways.

Section B - Answer all Questions

(4 x 10= 40 Marks)

5. Define the following
 - a) Camber
 - b) Carriage Way
 - c) Traffic Separator
 - d) Kerbs
 - e) Shoulders
 - f) Width of Pavement
6. A) How the Track circuiting in railways is done for railways. Explain with the figure and mark all components in the figure. (5 marks)
B) Derive the equation for the obtaining Stopping Sight Distance with Figure. (5 marks)
7. A) Derive the equation for obtaining Overtaking sight distance with figure. (5 marks)
B) The speed of overtaking and overtaken vehicle are 80 and 50 kmph, respectively on a two way traffic road. The average acceleration may be 0.80m/sec square. Assume reaction time of 3 seconds Calculate the safe overtaking sight distance, minimum and desirable length of overtaking zone (5 marks)
8. A) Explain the automatic signaling with working Procedure.
B) Explain the classification of rail flaws. As a Railway engineer, what are the actions you take to avoid train accidents when you detect those flaws (5+5 marks)

Section C - Answer the following

(2 X 20= 40 marks)

9. A) What is signaling, mention the classification of signaling according to function, location and specific purpose, Operational purpose. Explain about semaphore, warner signals with figure. (10 marks)
B) Explain the absolute block system for control of train movement. (5 marks)
C) Explain the NDT test done on Rail with figure to detect the flaws (5 marks)
10. A) Explain the coding used for identification of flaws or defects in rail section.
B) What is sleeper Density? What are various factors that has to be considered while choosing sleeper density. Draw a sketch showing various sleepers in a Joint

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Semester – 7th

Max. Marks : 100

Duration : 3 Hrs

Section A - Answer all Questions

(4 x 5= 20 Marks)

1. Calculate the minimum sight distance required to avoid head on collision of two cars approaching from opposite direction at 100 and 50 kmph. Assume reaction time of 3 seconds. Co-efficient of friction as 0.7 and brake efficiency of 50 percent in both cases.
2. Explain PIEV theory.
3. Explain Lag distance with an Example.
4. The design speed of Highway is 80kmph with 200 meter radius. Safe limit of transverse Co-efficient of friction is 0.15 a) Calculate the super elevation required to keep the speed b) Calculate the maximum allowable speed, if maximum super elevation is 7 percent of width of highway. At no condition the radius can be increased.

Section B - Answer all Questions

(4 x 10= 40 Marks)

5. Define formation? What are the functions of Formation? Explain the various failures of Formation with figure
6. A) How the Track circuiting in railways is done for railways. Explain with the figure and mark all components in the figure. (5 marks)
B) Derive the equation for the obtaining Stopping Sight Distance with Figure. (5 marks)
7. A) Derive the equation for obtaining Overtaking sight distance with figure. (5 marks)
B) The speed of overtaking and overtaken vehicle are 80 and 50 kmph, respectively on a two way traffic road. The average acceleration may be 0.80m/sec square. Assume reaction time of 3 seconds Calculate the safe overtaking sight distance, minimum and desirable length of overtaking zone (5 marks)
8. A) Explain the automatic signaling with working Procedure.
B) Explain the classification of rail flaws. As a Railway engineer, what are the actions you take to avoid train accidents when you detect those flaws (5+5 marks)

Section C - Answer the following

(2 X 20= 40)

9. A) Explain the coding used for identification of flaws or defects in rail section.
B) What is sleeper Density? What are various factors that has to be considered while choosing sleeper density. Draw a sketch showing various sleepers in a Joint
10. A) What is signaling, Mention the classification of signaling according to function, location and specific purpose, Operational purpose. Explain about semaphore, warner, disc and colored light signals with figure. (10 marks)
B) Explain the absolute block system for control of train movement (5 marks)
C) Explain the NDT test done on Rail with figure to detect the flaws (5 marks)