

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
SEVENTH SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2018

**Course Code: CE407**

**Course Name: TRANSPORTATION ENGINEERING - II**

Max. Marks: 100

Duration: 3 Hours

**PART A**

*Answer any two full questions, each carries 15 marks.*

- |   |  | Marks |
|---|--|-------|
| 1 | (a) List and define the component parts of a railway track   | ( 5 ) |
|   | (b) Explain the functions and requirements of rails  | (10 ) |
| 2 | (a) What is the equilibrium cant on a 2° curve on a BG track, if the speed of various trains are 10 trains at 50kmph., 8 trains at 55 kmph. and 4 trains at 60kmph. respectively | ( 5 ) |
|   | (b) Explain the various type of gradient used on railway track? What is grade compensation and why is it necessary?  | (10 ) |
| 3 | (a) Explain the term ballast less tracks and explain its advantages.   | (4 )  |
|   | (b) Enumerate the role of Indian railways in National development  | ( 6 ) |
|   | (c) What are the factors affecting the selection of gauges?  | ( 5 ) |

**PART B**

*Answer any two full questions, each carries 15 marks.*

- |   |  |      |
|---|--|------|
| 4 | a) What are the different types of signals according to location? Illustrate with the help of neat sketch              | (5)  |
|   | b) How are railway stations classified? Explain each with neat sketches  | (10) |
| 5 | a) Explain scissors crossover with neat sketch   | (5)  |
|   | b) What are the different systems of controlling the movement of trains? Explain the working of absolute block system. | (10) |
| 6 | a) Discuss on Conventional and Advanced Remedial Aids for preventing railway accidents.                                | (4)  |
|   | b) Draw a neat sketch of a Left hand turnout and mark its components.  | (6)  |
|   | c) Explain how the accidents are classified on Indian Railways.  | (5)  |

**PART C**

*Answer any two full questions, each carries 20 marks.*

- |   |   |      |
|---|---|------|
| 7 | a) List the various methods of tunnelling in hard and soft rocks. Explain in detail any one tunnelling method employed in hard strata and soft soil | (10) |
|---|---|------|

- b) Why shore protection works are necessary? Explain common forms of shore protection works (10)
- 8 a) Write notes on (10)
- (i) Lighting and Ventilation of tunnels
  - (ii) Lining of tunnels
- b) State the natural and meteorological phenomena a harbour engineer has to study and briefly mention the effects of these phenomena (10)
- 9 a) What are the various forces acting on breakwater? (5)
- b) Distinguish between (i) Wharf and Pier (ii) Transit shed and ware house (5)
- c) Write down the procedure for constructing a tunnel in clayey soil. Explain its advantages.(Draw necessary diagrams) (10)

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**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
SEVENTH SEMESTER B.TECH DEGREE EXAMINATION(S), MAY 2019

**Course Code: CE407**

**Course Name: TRANSPORTATION ENGINEERING - II**

Max. Marks: 100

Duration: 3 Hours

**PART A**

*Answer any two full questions, each carries 15 marks.*

Marks

- |   |   |      |
|---|---|------|
| 1 | (a) Sketch the typical cross section of B.G. track on embankment  | (5)  |
|   | (b) Describe the functions and requirements of ballast  | (10) |
| 2 | (a) What is coning of wheel? Why is it necessary for rail wheel interactions?   | (5)  |
|   | (b) A $8^\circ$ curve diverges from a main curve of $5^\circ$ in an opposite direction in the layout of a BG yard, calculate the super elevation and speed on the branch line, if the maximum speed permitted on the main line is 45km.p.h. | (10) |
| 3 | (a) What is meant by super elevation? What are the objects of providing SE on curves?   | (4)  |
|   | (b) Compare and differentiate the different types of rails with neat sketches.  | (6)  |
|   | (c) What are the various causes of creep?   | (5)  |

**PART B**

*Answer any two full questions, each carries 15 marks.*

- |   |  |      |
|---|--|------|
| 4 | a) Draw a sketch showing positions of various signals for a junction of two main line and two branch lines with a siding   | (5)  |
|   | b) What is a yard? What are the different types of yards? Explain the functions of a Marshalling yard and describe the points to be considered in its design.                            | (10) |
| 5 | a) A 1 in 8.5 crossover is laid between 2 BG parallel tracks with their centres 5m apart. Find length of straight track and overall length of the crossover.                             | (5)  |
|   | b) Explain different types of railway signals according to their function. With the help of neat sketch explain the essential features and working principle of a Semaphore type signal. | (10) |
| 6 | a) Differentiate between 'Daily maintenance' and 'Periodic maintenance'  | (4)  |
|   | b) Write short notes on warner signal, Shunting signal, and routing signal with neat sketches  | (6)  |
|   | c) What is Through packing and Scissor Packing? List the difference between them   | (5)  |

**PART C**

*Answer any two full questions, each carries 20 marks.*

- 7 a) Classify harbours on the basis of utility and explain the uses and requirements of them. (10)
- b) How is transferring of center line into the tunnel carried out? Explain with the help of neat diagram (10)
- 8 a) What is a bulk head? Explain shield method of tunnelling through water bearing soils (10)
- b) What is a dry dock? What are the classifications of dry dock? Explain in detail, any two types of dry docks with neat sketches. (10)
- 9 a) Explain the requirements of a good harbour. (5)
- b) Write short note on: (10)
- (i) Spring and Neap Tide
  - (ii) Littoral Drift
  - (iii) Tidal Bore
  - (iv) Offshore moorings
- c) Enumerate the various ship characteristics that affect the harbour design. (5)

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**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
SEVENTH SEMESTER B.TECH DEGREE EXAMINATION(R&S), DECEMBER 2019

**Course Code: CE407**

**Course Name: TRANSPORTATION ENGINEERING - II**

Max. Marks: 100

Duration: 3 Hours

**PART A**

*Answer any two full questions, each carries 15 marks.*

Marks

- |   |   |      |
|---|---|------|
| 1 | (a) What is the equilibrium cant on a $2^0$ curve on a BG track, if the speed of various trains are 10 trains at 50km.p.h., 8 trains at 55 km.p.h. and 4 trains at 60km.p.h. respectively | (5)  |
|   | b) Describe the functions and requirements of sleepers  | (10) |
| 2 | a) What is meant by Super elevation? What are the objects of providing SE on curves?  | (5)  |
|   | b) What is creep? What are the various causes of creep? List the various remedial measures  | (10) |
| 3 | a) Explain the term ballast less tracks and explain its advantages.   | (4)  |
|   | b) What are the factors affecting the selection of gauges?  | (5)  |
|   | c) Compare and differentiate the different types of rails with neat sketches.   | (6)  |

**PART B**

*Answer any two full questions, each carries 15 marks.*

- |   |   |      |
|---|---|------|
| 4 | a) Discuss on Conventional and Advanced Remedial Aids for preventing railway accidents.   | (5)  |
|   | b) Explain different types of railway signals according to their operational characteristics. With the help of neat sketch explain the essential features and working principle of a Semaphore type signal. | (10) |
| 5 | a) Draw a neat sketch of a Right hand turnout and mark its components.  | (5)  |
|   | b) What is a yard? What are the different types of yards? Explain the functions of a Marshalling yard and describe the points to be considered in its design.   | (10) |
| 6 | a) Explain (i) Three-throw (ii) Gathering lines   | (4)  |
|   | b) Explain locomotive yard and its components   | (5)  |
|   | c) What are the different systems of controlling the movement of trains? Explain the working of absolute block system.  | (6)  |

**PART C**

*Answer any two full questions, each carries 20 marks.*

- 7 a) What is an air lock? Describe the air lock method of tunnelling in soft soil (10)
- b) Write short note on (i) Spring and Neap Tide (iii)Littoral Drift (iv) Tidal Bore (10)  
(v)offshore moorings
- 8 a) How is transferring of center line into the tunnel carried out? Explain with the (10)  
help of neat diagram
- b) State the natural and meteorological phenomena a harbour engineer has to study (10)  
and briefly mention the effects of these phenomena
- 9 a) Write short notes on (10)
- a) Wet Docks
- b) Navigational aids
- b) Write down the procedure for constructing a tunnel in water bearing soil. Explain (10)  
its advantages.(Draw necessary diagrams)

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**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
SEVENTH SEMESTER B.TECH DEGREE EXAMINATION(R&S), MARCH 2020

**Course Code: CE407**

**Course Name: TRANSPORTATION ENGINEERING - II**

Max. Marks: 100

Duration: 3 Hours

**PART A**

*Answer any two full questions, each carries 15 marks.*

Marks

- |   |  |     |
|---|--|-----|
| 1 | a) What are the modern developments in Railways  | (8) |
|   | b) Explain track-alignment? What are the factors which control the alignment of a railway track?   | (7) |
| 2 | a) Write the different types of rail section. Mention relative merits and demerits of flat footed rails and bull headed rails.   | (5) |
|   | b) What should be the actual ruling gradient if the ruling gradient is 1 in 130 on a MG and a curve of 4 degree is super imposed on above track section?   | (5) |
|   | c) Explain in brief LRT and MRTS.  | (5) |
| 3 | a) From a BG yard an 6° curve branches off from a 3° main curve. If the speed is restricted to 35 km/h in the branch line and the permissible value of cant deficiency is 75 mm, determine the speed restriction on the main line. | (8) |
|   | c) What is creep? What are the causes and effects of creep?  | (7) |

**PART B**

*Answer any two full questions, each carries 15 marks.*

- |   |   |     |
|---|---|-----|
| 4 | a) A turnout is to be laid off a straight BG track with a 1 in 12 crossing. Determine the lead and radius of turnout with the help of following data: heel divergence = 133mm, crossing angle 4°45'49", switch angle 1°8'0", straight length between the theoretical nose of crossing and tangent point of crossing = 1.418m. | (8) |
|   | b) Explain the procedure of 'Through packing' and 'Scissor packing' and highlight the difference between them.  | (7) |
| 5 | a) Describe the various possible causes which may result into a railway accident and suggest the possible remedies for each   | (8) |
|   | b) What are the different systems of controlling the movement of trains? Explain the working of one system which has been widely used on Indian Railways.   | (7) |

- 6 a) Explain with neat sketch Reception signal and Departure signals (5)  
b) Explain the procedure of periodic track maintenance in detail. (5)  
c) Differentiate between C.T.C. system and A.T.C. system (5)

**PART C**

*Answer any two full questions, each carries 20 marks.*

- 7 a) What are the requirements of a good harbour? (10)  
b) Compare mound type break water with wall type breakwater with the help of sketches (10)
- 8 a) Explain the shield method of tunnelling with help of a sketch (10)  
b) What is the necessity of railway tunnel? Draw a sketch to illustrate a single track railway tunnel? (10)
- 9 a) Explain in detail the procedure of providing drainage and ventilation in tunnels. (10)  
b) Write short notes on: (10)  
(i) Moorings  
(ii) Wharves  
(iii) Transit Shed  
(iv) Quays

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Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

Seventh semester B.Tech examinations (S), September 2020

**Course Code: CE407****Course Name: TRANSPORTATION ENGINEERING - II**

Max. Marks: 100

Duration: 3 Hours

**PART A***Answer any two full questions, each carries 15 marks.*

Marks

- 1 a) Enumerate the role of Indian Railways in National development. (5)
- b) A  $6^0$  curve diverges from a  $4^0$  main curve in reverse direction in the layout of a B.G. track. Speed on branch line is restricted to 35 kmph. Determine the restricted speed on main line. (10)
- 2 a) If the ruling gradient is 1 in 150 on a particular section of Broad Gauge track and at the same time a curve of 4 degree is situated on this ruling gradient, what should be the allowable ruling gradient? (5)
- b) List out any four different urban rail-transits in India. What are tube-railways? (5)
- c) Sketch the typical cross-section of a railway track (5)
- 3 a) What is coning of wheels? Why is it necessary? (5)
- b) Discuss wave theory and percussion theory with respect to creep of rails. (5)
- c) Discuss any five factors affecting the selection of a good alignment of a railway track. (5)

**PART B***Answer any two full questions, each carries 15 marks.*

- 4 a) Explain about any four advanced technical remedial aids or measures for prevention of railway accidents. (8)
- b) On a straight B.G. track, a turnout takes off at an angle of  $6^0 42' 35''$ . Design the turnout if angle of switch is equal to  $1^0 8' 00''$ , length of switch rails is 4.73 m, heel divergence is equal to 11.43 cm and straight arm is equal to 0.85 m. (7)
- 5 a) Discuss about the maintenance and renewal of rails, sleepers and track fittings. (8)
- b) List out the different types of functional signals. Discuss in detail the working of any one signal with neat sketch. (7)

- 6 a) What is the purpose of providing marshalling yards? What are the main siding features of marshalling yards? Support your answers with appropriate figures. (8)
- b) What is packing? Explain the three different types of packing (7)

**PART C**

*Answer any two full questions, each carries 20 marks.*

- 7 a) Explain the three systems of mechanical ventilation of a tunnel with neat sketch. (10)
- b) How do you classify harbours? Explain in detail (10)
- 8 a) List out different methods of tunnelling in hard rocks. Explain any one of the method. (10)
- b) Discuss the three methods of mound construction. (10)
- 9 a) Draw neat sketch and explain the forces created due to wave action against a marine structure. What are the phenomena occurring due to these forces? (10)
- b) Explain the four different stages in setting out the centre line of tunnel. (10)

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Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

Seventh Semester B.Tech Degree Examination (Regular and Supplementary), December 2020

**Course Code: CE407****Course Name: TRANSPORTATION ENGINEERING - II**

Max. Marks: 100

Duration: 3 Hours

**PART A***Answer any two full questions, each carries 15 marks.*

Marks

- |   |  |      |
|---|--|------|
| 1 | a) Describe the role of Indian railway in national development.  | (5)  |
|   | b) Distinguish between LRT and MRT.  | (10) |
| 2 | a) Sketch the components of a permanent way and mark the salient points.   | (5)  |
|   | b) What is sleeper density? Explain the function of sleepers.  | (5)  |
|   | c) Explain different types of gradients used in rail alignments.   | (5)  |
| 3 | a) Write a brief note on ballast less tracks.  | (5)  |
|   | b) Find the final gradient for a broad gauge track where the grade resistance together with curve resistance due to a $2^\circ$ curve is equal to the resistance due to a ruling gradient of 1 in 200. | (5)  |
|   | c) Write Brief note on tube rail way.  | (5)  |

**PART B***Answer any two full questions, each carries 15 marks.*

- |   |   |     |
|---|---|-----|
| 4 | a) Explain the procedure of 'Through packing' and 'Scissor packing' and highlight the difference between them.  | (5) |
|   | b) What are the type of accidents generally occur in Indian Railways. What are the remedial measures?   | (6) |
|   | c) Explain the working of absolute block system.  | (4) |
| 5 | a) A turnout takes off from a straight BG track at an angle of $1^\circ 40' 22''$ with crossing angle $5^\circ 59' 20''$ . Length of the switch rail is 4.72m. Heel divergence is 11.7cm. Straight length of the track at the crossing is 0.8m. Design the turnout. | (8) |
|   | b) Draw a neat sketch of a Left hand turnout and mark its components.   | (7) |
| 6 | a) Explain how the accidents are classified on Indian Railways. Explain the various aids and methods for preventing railway accidents.  | (8) |

- b) What are the different systems of controlling the movement of trains? Explain the working of ATC system. (7)

**PART C**

*Answer any two full questions, each carries 20 marks.*

- 7 a) Write brief note on (10)  
i) Lighting and ii) ventilation of tunnelling
- b) Explain the working of i) TBM ii) Compressed Air method of tunnelling (10)
- 8 a) What are the classifications of tunnelling? (5)
- b) Write a brief note on tunnel lining. (7)
- c) What are breakwaters? Explain the necessity and functions of breakwaters. (8)
- 9 a) What are different types of Docks? Explain its functions. (7)
- b) Enlist various forces acting on break water and principles of design. (7)
- c) What are the types of signals and functions of signals used in ports? (6)

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