



INSTITUTE OF AERONAUTICAL ENGINEERING

(AUTONOMOUS)

Dundigal, Hyderabad - 500 043

CIVIL ENGINEERING

QUESTION BANK

| | | |
|--------------------|---|---|
| Course Name | : | TRANSPORTATION ENGINEERING-II |
| Course Code | : | A70143-R15 |
| Class | : | IV- B-Tech. |
| Branch | : | CIVIL ENGINEERING |
| Year | : | 2018 – 2019 |
| Course Coordinator | : | Ms. K. Anusha Hadassa, Assistant Professor, Department of CE. |
| Course Faculty | : | Ms. K. Anusha Hadassa, Assistant Professor, Department of CE. |

OBJECTIVES

To meet the challenge of ensuring excellence in engineering education, the issue of quality needs to be addressed, debated and taken forward in a systematic manner. Accreditation is the principal means of quality assurance in higher education. The major emphasis of accreditation process is to measure the outcomes of the program that is being accredited.

In line with this, Faculty of Institute of Aeronautical Engineering, Hyderabad has taken a lead in incorporating philosophy of outcome based education in the process of problem solving and career development. So, all students of the institute should understand the depth and approach of course to be taught through this question bank, which will enhance learner's learning process.

| S. No. | Question | Blooms Taxonomy Level | Program Outcome |
|--|--|-----------------------|-----------------|
| UNIT-I | | | |
| INTRODUCTION TO RAILWAY ENGINEERING | | | |
| PART A (Short Answer Questions) | | | |
| 1 | Define gauge. What are the different types of Rail gauges used in India | Remember | 2 |
| 2 | Define Track capacity. | Understand | 3 |
| 3 | What is coning of wheels? | Understand | 1 |
| 4 | When and between which two stations the first railway service was started? | Remember | 4 |
| 5 | Write about Whyte system and give an example? | Understand | 5 |
| 6 | Write a short note on meter gauges and its classification? | Remember | 5 |
| 7 | Define permanent way. | Understand | 3 |
| 8 | What is ballast? Name different types of ballast? | Remember | 5 |
| 9 | A sleeper manufacturing company casts a sleeper of 260 mm width and sends it to a railway site where the railway track laid, based on their study they decide to provide a spacing of 1.5m between the sleepers What is depth of ballast to be provided for effective distribution of load of train? | Understand | 7 |

| | | | |
|---------------------------------------|--|------------|---|
| 10 | Define formation. And what are its functions? | Remember | 5 |
| 11 | Define creep. Write about Whyte system and give an example? | Understand | 4 |
| 12 | What are the factors restricting the length of rails? | Remember | 5 |
| 13 | What are different types of rail sections used in Indian railways? | Remember | 6 |
| 14 | Define tractive resistance. Define permanent way. | Understand | 2 |
| 15 | Write about kinks? What is coning of wheels? | Understand | 5 |
| 16 | What are the functions of rails? | Remember | 5 |
| 17 | Define sleeper density. | Remember | 3 |
| 18 | Write about fish plates? | Remember | 5 |
| 19 | Write about ill effects of creep? | Understand | 7 |
| 20 | Write about suitability conditions for broad gauge and meter gauge? | Understand | 5 |
| 21 | Write a short note on creep? | Understand | 4 |
| PART B (Long Answer Questions) | | | |
| 1 | What are the factors governing the choice of gauge while construction of a railway line? Explain? | Remember | 1 |
| 2 | Write about the centrifugal force on a curved track with neat sketch? Explain about Equilibrium super elevation with necessary derivation? | Remember | 3 |
| 3 | Give a typical cross section of a permanent way on an embankment indicating various components and describe their functions? | Understand | 2 |
| 4 | Explain the classification of Railway stations? What are the considerations for site selection of railway stations? | Understand | 3 |
| 5 | What are the types of colored light signals and write what each signal indicate? Write about trap indicator? | Understand | 1 |
| 6 | What is coning of wheels explain with neat sketch? Write its advantages? | Remember | 1 |
| 7 | Write a short note on meter gauges and its classification? Define creep. | Remember | 2 |
| 8 | What are the major factors that influence site selection of an airport? Describe any three of them in detail? | Remember | 3 |
| 9 | What are the requirements of ideal permanent way? Describe briefly theories related to creep of rails? | Understand | 1 |
| 10 | Giving a typical cross section of permanent way on an embankment indicate various components and also describe components on permanent way? | Remember | 1 |
| 11 | What is the need of providing super elevation on curves of railway tracks? Describe relation between super elevation, gauge, speed and radius of curve? | Remember | 2 |
| 12 | Write short notes on switches, stock rails, heel divergence and throw of switch? | Understand | 1 |
| 13 | What is rail? Explain with the help of neat sketches the various types of rail failures? What are the tests required to test the sustainability of rail? | Understand | 1 |
| 14 | What are the permissible variations in dimensions of rails? What are the purposes of railway sleepers? Explain requirement of an ideal sleeper? | Remember | 1 |
| 15 | Write detailed notes on A) rail sections? B) Corrugated rails? C) Corrosion of rails and D) rail failures.? | Remember | 1 |
| 16 | What are the parameters involved in design of ballast section. Explain in detail about general fittings of rails? | Remember | 1 |
| 17 | What is a rail joint? State and explain various types of rail joints with neat sketches | Remember | 1 |
| 18 | Define the capacity of railway track. Suggest measures to increase the capacity of railway track? | Remember | 2 |
| 19 | What are the purposes of railway sleepers? Explain requirement of an ideal | Remember | 4 |

| | | | |
|---|---|------------|---|
| | sleeper? | | |
| 20 | Explain with the help of neat sketches the various types of rail failures? What are the tests required to test the sustainability of rail? | Remember | 3 |
| PART C (critical thinking) | | | |
| 1 | Give neat sketch of cross section along with center of sleeper of a B.G. railway track constructed with 44.7 kr/m F.F rails on steel sleepers and indicate more important dimensions on it? | Remember | 1 |
| 2 | Write short notes on history and development of roads? Different types of rails? Advantages and disadvantages of C.I sleepers, creep of rails, hogged rails , locomotive and rolling stock? | Remember | 1 |
| 3 | What are different types of railway surveys? | Remember | 1 |
| 4 | Determine the following from data for a crossing in B.G A) angle of switch B) cross leading c) radius of curve? | Remember | 1 |
| UNIT-II GEOMETRIC DESIGN OF RAILWAY TRACKS | | | |
| PART A (short answer questions) | | | |
| 1 | What are vertical curves? Name the types of vertical curves? | Understand | 2 |
| 2 | What is the function of vertical curve? | Remember | 1 |
| 3 | Define grade compensation. Write its values for BG, MG and NG | Remember | 1 |
| 4 | What is negative super elevation? | Remember | 1 |
| 5 | Define cant deficiency? What are its considerations? | Understand | 1 |
| 6 | What is the function of points and crossings? | Remember | 1 |
| 7 | Define crossing. | Remember | 1 |
| 8 | Write about trap indicator? | Remember | 1 |
| 9 | What are sighting boards? Where to position them? | Understand | 2 |
| 10 | What Are The methods Of Welding Rail joints? | Remember | 1 |
| 11 | What is turn out? What do you understand by direction of turnout? | Remember | 1 |
| 12 | Define diamond crossing. | Understand | 2 |
| 13 | Write about Gauntleted Track? | Understand | 2 |
| 14 | Write any three objectives of signaling? | Remember | 1 |
| 15 | What is co acting signal? | Remember | 1 |
| 16 | Name different types of crossings? | Remember | 1 |
| 17 | What are station yards? Name various types of station yards? | Remember | 1 |
| 18 | Define (a)Gradient (b)Ruling gradient | Remember | 1 |
| 19 | Define curve lead. What are the types of sleepers and under points and crossings railway tracks? | Remember | 1 |
| 20 | Name the methods for designing turnouts? | Understand | 2 |
| PART B (long answer questions) | | | |
| 1 | state the points to be considered while design of railway track? State the various components of cross section of railway track? | Understand | 2 |
| 2 | Define gradient in railway track and state the various classifications in gradients in railway track? | Understand | 2 |
| 3 | What is function transition curve in railway track? Define super elevation in railway track and state the advantages? | Remember | 2 |
| 4 | What is meant by cant deficiency? what are the points and crossing and state their objects? Define turnout in railway track? | Understand | 2 |

| | | | |
|---|--|------------|---|
| 5 | What are the types of sleepers and under points and crossings railway tracks? | Understand | 2 |
| 6 | What is track junction? State the type of junction railway track? And also state the type of function signals in railway track? | Understand | 2 |
| 7 | What is meant by station yard and state various types of station yards in railways? | Understand | 2 |
| 8 | What is plate laying in railway track? Explain briefly? | Remember | 1 |
| 9 | State the purpose of loco yards? State five suites of chief P.W.I? State the necessity of maintenance of track? | Remember | 1 |
| 10 | State five types of signals in railways? What is interlocking of signals in railways? | Remember | 1 |
| 11 | What are the essential features of semaphore signal? Explain the working of semaphore signal in detail with sketch. | Remember | 1 |
| 12 | What are the advantages of automatic signaling system? Differentiate in detail in between starter and advance starter signal, co-acting and repeater signal? | Remember | 1 |
| 13 | What is turnout in railway track? Draw the left hand turn out of railway showing various components? Explain briefly its functioning? | Remember | 1 |
| 14 | State the purpose of various yards in railway stations? Explain necessity of loco yard with neat sketches | Understand | 1 |
| 15 | State and explain the various methods plate laying of railway track? | Remember | 1 |
| 16 | State the various equipment needed at railway stations? Explain two among them with neat sketches? | Remember | 1 |
| 17 | Write in detail with the sketches A)Diamond crossing b) marshalling yards c) way side stations | Remember | 1 |
| 18 | Distinwish between gradient and super elevation of railway track? | Remember | 1 |
| 19 | What is crossing railway track and state the various types of crossing railway tracks? | Remember | 1 |
| 20 | Define classification of track maintaince | Remember | 1 |
| PART C (critical thinking questions) | | | |
| 1 | State the objectives of signaling. Allowing a cant deficiency of 7.5 cms. What super elevation should be provided on a 2 degree curve in BG track corresponding to speed of 100 Kmph | Understand | 2 |
| 2 | Determine the length of vertical curve between two gradiants meeting on a summit, one raising at the rate of 1 in 120 and other falling at the rate of 1 in 150 | Understand | 1 |
| 3 | Write about maximum super elevation for different ganges laid in railway tracks? | Understand | 1 |
| 4 | State the objectives of signaling. Allowing a cant deficiency of 8.5 cms. What super elevation should be provided on a 3 degree curve in BG track corresponding to speed of 200 Kmph | Understand | 1 |
| UNIT-III AIRPORT ENGINEERING | | | |
| PART A (short answer questions) | | | |
| 1 | What any four major problems faced by Airlines? | Remember | 2 |
| 2 | Define Taxi ways. | Understand | 1 |
| 3 | Define calm period. Enumerate the various factors which you would keep in view while selecting a suitable site for an airport | Remember | 3 |
| 4 | Write a short note on Apron? | Remember | 2 |
| 5 | Define Hangar. Explain briefly. What are the characteristics of modern type of international airport and explain briefly. | Understand | 2 |

| | | | |
|---------------------------------------|--|------------|---|
| 6 | What are visual Aids? | Understand | 2 |
| 7 | What are different types of airport markings? | Remember | 3 |
| 8 | Give abbreviations VFR, ICAO? | Remember | 2 |
| 9 | What are the different stresses induced in the flexible pavement? | Remember | 2 |
| 10 | What are the factors affecting in flexible pavement? | Remember | 2 |
| 11 | What is airport beacon? What is its function? | Remember | 2 |
| 12 | What is wind rose diagram? | Understand | 3 |
| 13 | What do you understand by runway numbering? | Remember | 3 |
| 14 | What is Terminal building? | Remember | 2 |
| 15 | What is the purpose of approach lighting systems? | Remember | 2 |
| 16 | What are the functions of Flight service station? | Understand | 2 |
| 17 | State and explain briefly the advantages of air transport compared to other modes of transport | Remember | 3 |
| 18 | State and explain briefly the limitations of airport | Remember | 2 |
| 19 | Explain briefly the administrative setup of ICAO. | Remember | 3 |
| 20 | state 8 main characteristics of aircraft | Understand | 2 |
| PART B (long answer questions) | | | |
| 1 | What is orientation of run way? Explain briefly. What are the characteristics of modern type of international airport and explain briefly. | Understand | 2 |
| 2 | State and explain various landing aids of medium type of airport. And also explain various methods of drainage at the airport campus. | Remember | 2 |
| 3 | Explain why top of hill is more suitable for locating an airport than the valley site. | Remember | 1 |
| 4 | State the items to be taken in to account in the selection of a site and layout for an airport from the points of the view of the following 1. Physical 2. Operational 3. Metrological considerations. | Remember | 3 |
| 5 | What is standard atmosphere? How it is used in determining the adjustment to be made in the length of runway? | Understand | 3 |
| 6 | Enumerate the various factors which you would keep in view while selecting a suitable site for an airport. | Remember | 2 |
| 7 | What are the corrections applied for basic runway length? explain each. | Remember | 2 |
| 8 | The length of runway under standard condition is 1620. The airport site has an elevation of 270 cm. its reference temperature is 32.9 0c. if the runway is to be constructed with an efficient gradient of 0.20 percent, determine the correct runway lenght | Remember | 2 |
| 9 | Explain in detail about the effect of performance requirements imposed by the government on aircraft manufactures and operators on runway length. | Understand | 1 |
| 10 | What are the different drawings and maps that should be prepared for the finally selected site for developing an airport? | Remember | 1 |
| 11 | Write short notes on the following 1 growth of air transport 2 national airport authority 3 methods of drainage of airport campus 4 grading of airport | Remember | 2 |
| 12 | Write short notes on 1 wind rose diagram 2 terminal facilities at airport 3 helicopters | Remember | 1 |

| | | | |
|--|---|------------|---|
| 13 | Distinguish characteristics of areocraft and jet aircraft | Remember | 2 |
| 14 | Distinguish the areocraft with jet engine and rocket engine | Remember | 1 |
| 15 | Distinguish topographical survey and soil survey for the selection of site at airport | Remember | 1 |
| 16 | Distinguish the corrections for site distance and ingredient while designing the runway. | Remember | 1 |
| 17 | Distinguish airport markings and airport lightings. | Remember | 2 |
| 18 | Distinguish underground drainage and subsurface drainage in airport campus. | Remember | 1 |
| 19 | Define emergency repairs of airfield pavements. | Remember | 1 |
| 20 | Define runway lightening and types of lightening. | Remember | 2 |
| PART C (critical thinking questions) | | | |
| 1 | The runway gradation map indicates that there is a rising gradient of 1.0 percent meeting a falling gradient of 0.7 percent. There is again up grade of 0.70 percent. Design the runway profile as per FAA specifications | Understand | 1 |
| 2 | The length of runway under standard conditions is 1620 m. the airport site has elevation of 270 m. its reference temperature is 32.9oc. if the runway is to be constructed into an effective gradient 0.20 percent. Determine the correct runway length | Understand | 1 |
| 3 | Determine the length of the runway required from the following data: A) Basic runway length under standard atmospheric condition 1800 meters. B) Site elevation 1000 m above M.S.L C) Aerodrome reference temperature 17oc D) Effective gradient of 0.5%. | Understand | 4 |
| UNIT 4 PORT AND HARBOUR ENGINEERING | | | |
| PART A (short answer questions) | | | |
| 1 | Define inland water transport. | Understand | 4 |
| 2 | What do you understand by Tidal range? | Remember | 3 |
| 3 | Define break waters. Explain classification of ports? | Remember | 3 |
| 4 | Define piers. | Remember | 3 |
| 5 | What are floating light stations? | Understand | 3 |
| 6 | Define spring Tides. What do you understand by wear houses? Explain? | Remember | 1 |
| 7 | Define Neap Tides. | Remember | 3 |
| 8 | Define Wharves. What do you understand by wear houses? Explain? | Remember | 3 |
| 9 | What are Quays? | Understand | 3 |
| 10 | What are Jetties? Write about inland water transport(IWT) | Remember | 3 |
| 11 | What are fenders? | Remember | 4 |
| 12 | What are wreck buoys? | Remember | 1 |
| 13 | What do you audible signals in ports? | Remember | 2 |
| 14 | What are dry docks? Write about classification of break waters? Explain any one of them? | Remember | 2 |
| 15 | What are wet Docks? Also explain regarding revitalization of IWT in cities? | Remember | 2 |
| 16 | Define cold storages. Explain classification of ports? | Remember | 2 |
| 17 | Write the differences between dry docks and Wet docks? | Remember | 2 |
| 18 | Write about inland water transport(IWT) | Remember | 2 |

| | | | |
|---|--|------------|---|
| 19 | Decline of inland water transport? Also explain regarding revitalization of IWT in cities? | Remember | 3 |
| 20 | Define Harbour? Explain classification of harbours? | Remember | 3 |
| PART B (long answer questions) | | | |
| 1 | What are the factors that influence the site selection of a harbour? | Remember | 2 |
| 2 | Define port? Explain classification of ports? | Understand | 3 |
| 3 | What are the factors to be considered while designing a port? Write the requirements of a good port? | Remember | 3 |
| 4 | What are break waters? Write about classification of break waters? Explain any one of them? | Remember | 4 |
| 5 | What are the different aspects to be considered in the design of break? Discuss them? | Remember | 4 |
| 6 | Write about Jetties? Write about inland water transport(IWT) | Understand | 1 |
| 7 | Explain different types of fenders? Write about inland water transport(IWT) | Remember | 2 |
| 8 | What are the qualities of good fenders? | Remember | 2 |
| 9 | Write a short note about light house and its construction? | Remember | 2 |
| 10 | Write about maintenance requirements in ports and harbours? | Understand | 2 |
| 11 | Write in detail on Transit sheds? Write about inland water transport(IWT) | Remember | 2 |
| 12 | What do you understand by wear houses? Explain? | Remember | 3 |
| 13 | Write a short note on (a) Dredging (b) buoys | Remember | 3 |
| 14 | Explain about (a) Quays (b) Wharves | Remember | 4 |
| 15 | Define types of harbours and classification of ports | Remember | 4 |
| 16 | Define requirements of signals | Remember | 1 |
| 17 | What is water transportation? Explain inland water transportation? | Remember | 2 |
| 18 | Explain in detail about types of harbours? | Remember | 2 |
| 19 | Explain the features of harbor and its planning. | Remember | 2 |
| 20 | Explain in detail about the maintenance of harbour | Remember | 2 |
| PART C (critical thinking questions) | | | |
| 1 | What are the factors that influence the site selection of a harbour? | Understand | 1 |
| 2 | Define port? Explain classification of ports? | Remember | 1 |
| 3 | What are the factors to be considered while designing a port? Write the requirements of a good port? | Understand | 2 |
| 4 | Decline of inland water transport? Also explain regarding revitalization of IWT in cities? | Understand | 4 |
| UNIT-V | | | |
| INTELLIGENT TRANSPORT SYSTEMS | | | |
| PART A (short answer questions) | | | |
| 1 | Explain about ITS architecture? | Understand | 1 |
| 2 | Define ITS. What are the different aspects to be considered in the design of break | Remember | 3 |
| 3 | What do you understand by electronic payment? | Remember | 3 |
| 4 | Write about lateral collision avoidance? | Remember | 3 |
| 5 | Define Ramp metering? | Understand | 3 |

| | | | |
|---------------------------------------|---|------------|---|
| 6 | What are dynamic message signs? What are the different aspects to be considered in the design of break | Remember | 1 |
| 7 | What do you understand by status objects in ITS ? | Remember | 3 |
| 8 | Define smart car. Explain about ITS components and standards | Remember | 1 |
| 9 | What is blind spot. | Understand | 1 |
| 10 | Define about advanced public transport system. | Remember | 2 |
| PART B (long answer questions) | | | |
| 1 | Define automatic vehicle allocation and automatic vehicle identification. Explain in detail. What is blind spot. | Remember | 2 |
| 2 | Explain in detail about the applications used in intelligent transport system | Understand | 2 |
| 3 | Explain about ITS components and standards. What do you understand by electronic payment? | Remember | 2 |
| 4 | Write an overview of ITS implementation in developed countries | Remember | 1 |
| 5 | How can ITS can be used in India. | Remember | 3 |
| 6 | Explain about the detectors used in ITS Define smart car. Define smart car. Explain about ITS components and standards | Understand | 2 |
| 7 | Write about the benefits of ITS in detail. What do you understand by electronic payment? | Remember | 1 |
| 8 | Explain about advanced traffic management systems in ITS | Remember | 2 |
| 9 | Write about the user services of ITS in India | Remember | 1 |
| 10 | Write it detail about ITS architecture. | Understand | 2 |
| 11 | Define ITS safety and security. What are the different aspects to be considered in the design of break | Remember | 1 |
| 12 | Define about automatic vehicle allocation. Define about advanced public transport system | Understand | 1 |
| 13 | What are dynamic message signs? Define Ramp metering. | Understand | 2 |
| 14 | Give an introduction to applications in ITS. | Understand | 1 |
| 15 | Define smart car? What is blind spot? Define about advanced public transport system | Remember | 2 |
| 16 | Explain in detail about public transport system. Write about lateral collision avoidance? | Understand | 1 |
| 17 | How can ITS be used in electronic pavements | Understand | 2 |
| 18 | Write in detail about (a) Dredging (b) buoys | Understand | 1 |
| 19 | Explain about (a) Quays (b) Wharves Write about lateral collision avoidance? | Remember | 1 |
| 20 | Explain about ITS used in day today life. Describe in detail about public transport system. Write about lateral collision avoidance | Understand | 3 |
| PART C (critical thinking) | | | |
| 1 | Define automatic vehicle allocation and automatic vehicle identification. Explain in detail | Understand | 1 |
| 2 | Explain in detail about the applications used in intelligent transport system | Remember | 2 |
| 3 | What do you understand by electronic payment? | Understand | 1 |
| 4 | Write about lateral collision avoidance? | Understand | 2 |

Prepared By: Ms. K. Anusha Hadassa, Assistant Professor, Civil Engineering

HOD, CE

