**(3Hours)**                                                                                    **Total marks=80**

**Note**   1.   Question No **1 is compulsory**.
      2.   Attempt Any **3** out of remaining
      3.   Assume any suitable data wherever required.

**Q.1**

   **a.**   i.   _____ is used for servicing and repairs of the aircraft   **10**
       ii.   The runway length after correcting or elevation and temperature is 2845m. If the effective gradient on runway is 0.5% then the revised runway length will be _____
      iii.   Distance between inner faces of the flanges, is kept slightly less/ equal/ more than gauge distance.
      iv.   Bearings are provided in bridges to_____
      v.   Every port is a harbor. True / False

   **b.**   Explain Negative Super elevation by a neat sketch.   **5**
   **c.**   As per ICAO classify various types of airports? Enlist some of the Airports in India   **5**

**Q 2**   **a.**   What is ballast? Why is it used in the railway track?  Briefly describe the various types of ballast used?   **10**
   **b.**   Design the Exit runway joining a runway and a parallel main taxiway. The total angle of turn is 35$^0$C and the maximum turn-off speed is 80 Kmph   **10**

**Q.3**   **a.**   Explain the different types of Railway yards and their functions with neat diagrams.   **10**
   **b.**   Design a turnout of 1 in 8.5 for a BG track assuming the curve is tangential to tongue rail, it springs up from the heel of switch at $1^0$ 8' 0" and ends TNC. Assume heel divergence =13.3.   **10**

**Q.4**   **a**   The length of runway under standard condition in 2100mt. It is to be at elevation of 410 mts above the M.S.L. The ART is 32$^0$ C. The construction plan provides the following data .Calculate the corrected length. Also apply check   **10**

| End to End runway (m) | 0-300 | 300-900 | 900-1500 | 1500-1800 | 1800-2100 | 2100-2700 | 2700-3000 |
|---|---|---|---|---|---|---|---|
| Grade % | +1.0 | -0.50 | +0.50 | +1.00 | -0.50 | -0.04 | -0.10 |

   **b.**   Explain in detail Airport obstructions with neat sketches?   **10**

**Q.5**   **a.**   What would be the Equilibrium Cant on BG track of $7^0$ for an average speed of train 80 kmph? Also calculate the maximum permissible speed after allowing the maximum cant deficiency?   **10**
   **b.**   Explain the working of Semaphore Signals with neat sketch   **10**

**Q.6**   **a.**   Explain Wind rose diagram? What is its utility and its types? Explain each type with neat sketches?   **10**
   **b.**   Define Breakwaters and mention various breakwater   **5**
   **c.**   Describe with neat sketch  (i) Diamond crossing  (ii) cross over   **5**

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