SIDDHARTH GROUP OF INSTITUTIONS :: PUTTUR
Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

Subject with Code : TE –II (13A01703) **Course & Branch**: B.Tech - CE

Year & Sem : IV- B.Tech & I- Sem **Regulation:** R13

UNIT –I

RAILWAY ENGINEERING

1. a) Explain briefly about the following
   i) Adzing sleepers
   ii) Ballast
   iii) Sleepers
   iv) Wear in rails
   b) Explain theories related to creep with neat figures and factors for determining the magnitude of creep

2. a) What is meant by coning of wheels? What are the disadvantage of coning of wheels?
   b) What are the different materials used for sleepers on the Indian railways? Which materials you prefer for laying a track in present conditions and explain.

3. a) Explain the different types of rails along with the transformation from wooden rails to steel rails
   b) What are the advantages of the rails?

4. What are the functions of sleepers? What are the factors on which sleeper's effect?

5. a) Why ballast need to use in construction of a railway track? Briefly explain for various types of ballast used.
   b) Explain various types of rail joints.

6. a) Illustrate with sketches the various fastenings used to faster to sleepers. Discuss their merit and demerits
   b) What are the various fastenings used to faster rails to sleepers? Discuss their merits and demerits

7. Explain theories related to creep with neat sketch and also explain the factors for determining the magnitude of creep

8. Define the term permanent way. Draw the various components of permanent way.

9. What are the requirements of rail joint? Explain the different types of rail joint.
10. a) what is meant by permanent way? What are the components of permanent way?
    b) What is a ballast? What are the requirements of ballast?
    c) Define creep of rails.
    d) Define coning of wheels.
    e) Define sleepers and mention any two requirements of sleepers

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UNIT –I

RAILWAY ENGINEERING

1) Mr. W. Simms, the consulting Engineer to the Government of India recommended the gauge for Indian railways [ ]

(a) 1.435 m as adopted in England (b) 1.800 m as per Indian conditions

(c) 1.676 m as a compromise gauge (d) 1.000 m as a standard gauge

2) If absolute levels of rails at the consecutive axles A, B, and C separated by 1.8 metres are 100.505 m, 100.530 m, and 100.525 m respectively, the unevenness of rails, is [ ]

(a) 0.065 m (b) 0.055 m (c) 0.045 m (d) 0.035 m

3) A CST-9 sleeper consists of [ ]

(a) two inverted triangular pots on either side of rail seat

(b) a central plate with a projected key and box on the top of plate

(c) a tie bar and 4 cotters to connect two cast iron plates

(d) all the above

4) Charles Vignola's invented the flat footed rails in [ ]

(a) 1814 (b) 1836 (C) 1846 (d) 1856

5. To design a cross-over between parallel tracks, the required components are : [ ]

(a) two switch, points, two acute angle crossings and two check rails

(b) two switch points, two acute angle crossings and four check rails

(c) two switch points, two acute angle crossings and six check rails

(d) none of these.

6. The first Indian railway was laid in [ ]

(a) 1775 (b) 1804 (c) 1825 (d) 1853

7. The weight of the rails depends upon [ ]

(a) gauge of the tracks (b) speed of trains (c) spacing of sleepers (d) all the above.

8. Pick up the correct statement from the following : [ ]

(a) Rails are directly laid over hard wooden sleepers and fixed with spikes

(b) Adzing is done on hard wooden sleepers

(c) Bearing plates are used on soft wooden sleepers

(d) All the above.

9. Pick up the incorrect statement from the following: [ ]

(a) Fish plates fit the underside of the rail head (b) Fish plates fit the top of the rail foot

(c) Fish plates fit the web of the rail section (d) Cross sectional area of fish plates, is normally the same as that of the rail section.

10. Minimum depth of ballast prescribed of B.G. trunk lines of Indian Railways, Is [ ]

(a) 20cm (b) 15cm (c) 25cm (d) 30cm

11.Boxing of ballast is done [ ]

(a) under rails (b) at the rails (c) in between two rails (d) in between two sleepers.

12. Best ballast contains stones varying in size from [ ]

(a) 1.5 cm to 3 cm (b) 2.0 cm to 4 cm (c) 2.0 cm to 5 cm (d) 2.5 cm to 6 cm

13. For holding a rail in position, no chairs are used for [ ]

(a) flat footed rails (b) bull headed rails (c) double headed rails (d) both (a) and (b)

14. Distance between the inner rail and check rail provided on sharp curve, is [ ]

(a) 40mm (b) 42mm (c) 44mm (d) 46mm

15. Coal ash (or cinder) is used in initial stages of a new construction of railway for [ ]

(a) wooden sleepers (b) steel sleepers (c) cast iron sleepers (d) none of these.

16. Pot sleepers are in the form of [ ]

(a) a number of bowls connected together with a tie bar

(b) two bowls placed under each rail and connected together with a tie bar

(c) two bowls placed under two rails and the one between the rails

(d) none of these.

17. In railways a triangle is mainly provided for [ ]

(a) diverting trains from the main line to branch line (b) crossing over between parallel tracks

(c) changing direction of engines through 180° (d) shunting wagons in yards.

18. A kink is made in stock rails, ahead of the toe of switch at a distance of [ ]

(a) 10cm (b) 15cm (c) 20cm (d) 30cm

19. If L is length of a rail and R is the radius of a curve, the versing h for the curve, is [ ]

(a) $a=L/4R$ (b) $a=L^2/4R$ (c) $h=L^2/8R$ (d) $h=L^2/16R$

20. Rails are bent to correct curvature if the degree of curve, is more than [ ]

(a) 1^0 (b) 2^0 (c) 3^0 (d) 4^0

21. In India the rails are manufactured by [ ]

(a) open hearth process (b) duplex process (c) both (a) and (b) (d) neither (a) nor (b)

22. Rail section first designed on Indian railways, was [ ]

(a) double headed (b) bull headed (c) flat footed (d) (a) and (b) simultaneously

23. A scissors cross-over consists of [ ]

(a) two pairs of points, four acute angle crossings and two obtuse angle crossings

(b) four pairs of points, four acute angle crossings and four obtuse angle crossings

(c) four pairs of points, six acute angle crossings and two obtuse angle crossings

(d) two pairs of points, six acute angle crossings and four obtuse angle crossings.

24. To prevent percolation of water into formation, moorum is used as a blanket for [ ]

(a) black cotton soil (b) sandy soil (c) clayey soil (d) all the above.

25. Distance between inner faces of the flanges, is kept [ ]

(a) equal to the gauge distance (b) slightly less than the gauge distance

(c) slightly more than the gauge distance (d) none of these.

26. Wooden sleepers used on the girders of bridges, are generally made of [ ]

(a) sal (b) chir (c) teak (d) deodar

27. If L1 and L2 are actual and theoretical lengths of a tongue rail, d is heel divergence and t is thickness of tongue rail at toe, the switch angle α is [ ]

(a) 25 (b) 30 (c) 45 (d) 60

28. If D is distance between centres of two parallel track of gauge G, then, total length of cross-over (from the point of commencement to the point of termination) with an intermediate straight portion and N crossing, is given by [ ]

(a) DN + G (N +√ 1 + N2) (b) DN + G (2N +√ 1 + N2)

(c) DN + G (3N +√ 1 + N2) (d) DN + G (4N +√ 1 +N2)

29. If a 0.7% upgrade meets a 0.65% downgrade at a summit and the permissible rate of change of grade per chain length is 0.10%, the length of the vertical curve, is [ ]

(a) 10 chains (b) 12 chains (c) 14 chains (d) 16 chains

30. Overall depth of a dog spike is [ ]

(a) 120.6mm (b) 155.90mm (c) 135mm (d) 150mm

31. Best wood for wooden sleepers is [ ]

(a) chir (b) deodar (c) sal (d) teak

32. The rail section which is not used on Indian metre gauge tracks, is [ ]

(a) 25R (b) 30R (c) 35R (d) 40R

33. Dimensions of a plate girder, are : [ ]

(a) 851 mm x 851 mm (b) 255 mm x 254 mm (c) 851 mm x 254 mm (d) 551 mm x 254 mm

34. Rail joint supported on a single sleeper, is known [ ]

(a) Suspended rail joint (b) bridge rail joint (c) supported rail joint (d) square rail joint.

35. Maximum wheel base distance provided on Indian B.G. tracks, is [ ]

(a) 4.096m (b) 5.096m (c) 6.096m (d) 7.096m

36. The tread of wheels is provided an outward slope of [ ]

(a) 1 in 10 (b) 1 in 15 (c) 1 in 20 (d) 1 in 25

37. On a straight railway track, absolute levels at point A on two rails are 100.550 m and 100.530 m and the absolute levels at point B 100 m apart are 100.585 m and 100.515 m respectively, the value of twist of rails per metre run, is [ ]

(a) 0.4mm (b) 0.5mm (c) 0.7mm (d) 0.8mm

38. Bearing plates are used to fix [ ]

(a) Flat footed rails to the wooden sleepers (b) double headed rails to the wooden sleepers

(c) Bull headed rails to the wooden sleepers (d) flat footed rails to the cast iron sleepers

39. A welded rail joint is generally [ ]

(a) Supported on a sleeper (b) supported on a metal plate (c) suspended (d) none of these.

40. Safe speed (V) on a curve of radius 970 metres provided with two transition curves on Board Gauge track, is [ ]

(a) 112 km/hour (b) 122 km/hour (c) 132 km/hour (d) 142 km/hour

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UNIT – II
GEOMETRIC DESIGN OF RAILWAY TRACK

1. a) What is the necessity for geometric design of a railway track? What are the elements to be Considered in the design
   b) Draw a neat sketch of a left hand turnout and name its various components
2. a) Define interlocking and mention essential principles of inter locking
   b) Describe the methods of interlocking and explain anyone method in detail with the help of a Simple case
3. a) Explain the different types of crossings with their important features.
   b) Draw a neat sketch of a right hand turnout taking off from a straight broad gauge track and Name and name its various components
4. a) define a railway yard and discuss the various types of yards?
   b) What is the purpose of providing marshalling yards? Describe the layout of a typical marshalling yards?
5. Give the classification of signal according to their location in station yard along with suitable Sketches?
6. a) Explain the factors in selecting the site for a railway station?
   b) What are the objectives of signaling? List out the classification of signal?
7. Explain the classification of station yard?
8. Explain the following terms:
   a) Gradient b) Grade Compensation
   c) Negative Super Elevation d) Cant Deficiency
9. a) Derive the expression for degree of curve? Explain the different types of crossing with important features?
   b) Define Gradient? What are the different types of gradients? Explain?

10. a) What are the functions of left hand and right hand turns?

b) Define super elevation and explain factors affecting super elevation?

c) Write a short notes on Grade Compensation?

d) Define yard? What are the different types of yards?

e) Write a short notes on safe speed on railway track?

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UNIT – II

GEOMETRIC DESIGN OF RAILWAY TRACK

1) The rail is designated by its [ ]

a) length b) weight c) cross-section d) weight per unit length

2) Two important constituents in the com-position of steel used for rail are [ ]

a) carbon and silicon b) manganese and phosphorous

c) carbon and manganese d) carbon and sulfur

3) The standard length of rail for Broad Gauge and Meter Gauge are respectively [ ]

a) 12 m and 12 m b) 12 m and 13 m c) 13 m and 12 m d) 13 m and 13 m

4) Largest dimension of a rail is its [ ]

a) height b) foot width c) head width d) any of the above

5) Largest percentage of material in the rail is in its [ ]

a) head b) web c) foot d) head and foot both

6) The purpose of providing fillet in a rail section is to [ ]

a) increase the lateral strength b) increase the vertical stiffness

c) avoid the stress concentration d) reduce the wear

7) The cross-sectional area of 52 kg flat footed rail is [ ]

a) 6155 mm2 b) 6615 mm2 c) 7235 mm2 d) 7825 mm2

8) 52 kg rails are mostly used in [ ]

a) Broad Gauge b) Metre Gauge c) Narrow Gauge d) both (a) and (b)

9) Tensile strength of steel used in rails should not be less than [ ]

a) 450 MPa b) 500 MPa c) 700 MPa d) 850 MPa

10) Head width of 52 kg rail section is [ ]

a) 61.9 mm b) 66.7mm c) 67mm d) 72.33 mm

11) 60 R rails are mostly used in [ ]

a) Broad Gauge b) Metre Gauge c) Narrow Gauge d) none of the above

12) Ordinary rails are made of [ ]

a) mild steel b) cast iron c) wrought iron d) high carbon steel

13) The main function of a fish plate is [ ]

a) to join the two rails together b) to join rails with the sleeper

c) to allow rail to expand and contract freely d) none of the above

14) Number offish bolts per fish plate is [ ]

a) 2 b) 4 c) 5 d) 6

15) Fish plate is in contact with rail at [ ]

a) web of rail b) fishing plane c) head of rail d) foot of rail

16) Gauge is the distance between [ ]

a) center to center of rails b) running faces of rails

c) outer faces of rails d) none of the above

17) For developing thinly populated areas, the correct choice of gauge is [ ]

a) Broad Gauge b) Meter Gauge c) Narrow Gauge d) any of the above

18) Due to battering action of wheels over the end of the rails, the rails get bent down and are deflected at ends. These rails are called [ ]

a) roaring rails b) hogged rails c) corrugated rails d) buckled rails

19) The slipping of driving wheels of locomotives on the rail surface causes [ ]

a) wheel burns b) hogging of rails c) scabbing of rails d) corrugation of rails

20) The width of foot for 90 R rail section is [ ]

a) 100 mm b) 122.2 mm c) 136.5 mm d) 146.0 mm

21) The height of the rail for 52 kg rail section is [ ]

a) 143 mm b) 156 mm c) 172 mm d) 129 mm

22) The formation width for a single line meter gauge track in embankment as adopted on Indian Railways is [ ]

a) 4.27 m b) 4.88 m c) 5.49 m d) 6.10 m

23) The side slope of embankments for a railway track is generally taken as [ ]

a) 1:1 b) 1.5:1 c) 2:1 d) 1:2

24) The formation width for a double line Broad Gauge track in cutting (excluding drains) as adopted on Indian Railways is [ ]

a) 6.10 m b) 8.84 m c) 10.21 m d) 10.82 m

25) The total gap on both sides between the inside edges of wheel flanges and gauge faces of the rail is kept as [ ]

a) 10 mm b) 13 mm c) 16 mm d) 19 mm

26) Creep is the [ ]

a) longitudinal movement of rail b) lateral movement of rail

c) vertical movement of rail d) difference in level of two rails

27) Anticreep bearing plates are provided on [ ]

a) bridges and approaches b) joints c) both (a) and (b) d) none of the above

28) The maximum degree of curvature for Meter Gauge is limited to [ ]

a) 10° b) 16° c) 30° d) 40°

29) Staggered joints are generally provided [ ]

a) on curves b) on straight track

c) when two different rail sections are required to be joined d) none of the above

30) When the rail ends rest on a joint sleeper, the joint is termed as [ ]

a) supported rail joint b) suspended rail joint

c) bridge joint d) base joint

31) Which of the following types of sleepers is preferred on joints ? [ ]

a) CST-9 sleeper b) steel trough sleeper c) wooden sleeper d) concrete sleeper

32) Minimum depth of ballast cushion for a Broad Gauge wooden sleeper of size 275x25x13 cm with 75 cm sleeper spacing is [ ]

a) 15 cm b) 20 cm c) 25 cm d) 30cm

33)The sleepers resting directly on girder are fastened to the top fiange of girder by [ ]

a) hook bolts b) dog spikes c) fang bolts d) rail screws

34) Number of keys used in CST-9 sleeper is [ ]

a) 2 b) 3 c) 4 d) none of the above

35) Loose jaws of steel trough sleepers are made of [ ]

a) cast steel b) mild steel c) cast iron d) spring steel

36) Number of cotters used in CST-9 sleepers is [ ]

a) 2 b) 3 c) 4 d) 5

37) Pandrol clips cannot be used with [ ]

a) wooden sleepers b) concrete sleepers c)CST-9 sleepers d) steel trough sleepers

38) The desirable rate of change of cant deficiency in case of Metre Gauge is [ ]

a) 20 mm/sec b) 35 mm/sec c) 55 mm/sec d) 65 mm/sec [ ]

39) The limiting value of cant excess for Broad Gauge is [ ]

a) 55 mm b) 65 mm c) 75 mm d) l00 mm [ ]

40) The limiting value of cant gradient for all gauges is [ ]

a) 1 in 360 b) 1 in 720 c) 1 in 1000 d) 1 in 1200

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UNIT – III

AIRPORT ENGINEERING

1) What factors to be given consideration in the selection of a site for an airport? Explain.
2) Explain the important characteristics of an aircraft their influence on airport planning
3) Explain about the turning radius of the aircraft and discus how it influence the taxiway design.
4) Give a typical layout of a single runway airport showing all the components.
5) Explain the various survey to be conducted and the data to be collected for airport site collection.
6) Write a short note on planning of terminal area of Airport Engineering?
7) Draw a typical Airport layout showing different components?
8) (a) What are the different surveys to be carried out for a site selection of an Airport?
   (b) Write any three characteristics of aircraft
   (c) Write any four factors that affects Airport site selection
   (d) Write about different design elements that should be consider in Aircraft characteristics
   (e) Define
      1. Apron
      2. Shoulders
      3. Anchorage
      4. Terminal area

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UNIT – III

AIRPORT ENGINEERING

1) The threshold markings are [ ]

a) 4 m wide b) 1 m clear space between adjacent c) 45 m in length d) all the above

2) The bearing of the longest line of a wind rose is *S* 45° *E*, the bearing of the runway will be numbered [ ]

a) 135° b) 31 c) 13 d) both b & c

3) For the proposed runway stated in if the aerodrome reference temperature is 17°.2, the net designed length of the runway is [ ]

a) 2716 m b) 2816 m c) 2916 m d) 3016 m

4) The lift off distance is the distance along the centre of the runway between the starting point and [ ]

a) end of the runway b) end of stop way

c) point where air craft becomes air borne d) none of these

5) The runway orientation is made so that landing and takeoff are [ ]

a) against the wind direction b) along the wind direction

c) perpendicular to wind direction d) none of these.

6) An aircraft is flying in an atmosphere of 30°C with a speed of 1260 km ph. Its speed is known as

a) subsonic b) sonic c) supersonic d) mach

7) According to I.C.A.O. the slope of transitional surface at right angles to the centre line of runway, is kept [ ]

a) 1 in 4 b) 1 in 5 c) 1 in 6 d) 1 in 7

8) The depressions and undulations in the pavement, are caused due to [ ]

a) improper compaction of sub grade b) impact of heavy wheel loads

c) punching effect d) all the above

9) Airport elevation is the reduced level above M.S.L. of [ ]

a) control tower b) highest point of the landing area

c) lowest point of the landing area d) none of these

10) The reduced level of the proposed site of an air port is 2500 m above M.S.L. If the recommended length by I.C.A.O. for the runway at sea level is 2500 m, the required length of the runway is

a) 2500 m b) 3725 m c) 3000 m d) 3250m [ ]

11) According to I.C.A.O. the recommended length of air ports is decided on [ ]

a) sea level elevation b) standard sea level temperature (15°C)

c) effective gradient percentage d) all the above.

12) The meterological condition which influences the size and location of an air port is [ ]

a) atmosphere pressure b) air density c) reduced level d) all the above

13) Conical surface of the approach area rises outwards [ ]

a) 1 in 10 b) 1 in 15 c) 1 in 20 d) 1 in 25

14) The thickness design of the pavement, is decided on the load carried by [ ]

a) main gears b) nose wheel c) tail wheel d) all the above

15) For Class *A* Air port the difference of reduced levels of higher and lower edges of the conical surface, is [ ]

a) 25 m b) 50 m c) 75m d) 100 m

16) Beaufort scale is used to determine [ ]

a) strength of winds b) direction of winds c) height of air-crafts d) none of these

17) The fuse large includes [ ]

a) passengers chamber b) pilot's cabin c) tail of aircraft d) all the above.

18) The distance between main gears is 10 m, and the distance of nose gear from centre of main gears is 30 m. If the angle of turning is 60°, the distance of centre of rotation from the nearer main gear, is

a) 12.30 m b) 11.30 m c) 10.30 m d) 9.30 m

19) To cope up high temperature of 196°C, the taxi ways and aprons are constructed with [ ]

a) asphaltic concrete b) rubberized tar concrete c) plain concrete d) all the above

20) From the end of an instrumental runway, the approach surface rises outwards [ ]

a) 1 in 20 b) 1 in 30 c) 1 in 40 d) 1 in 50

21) A gradient of + 0.08% is followed by a gradient of - 0.07%. If the permissible rate of change of grade is 0.003 per 30 metres, the length of the transition curve, is [ ]

a) 150 m b) 160 m c) 175 m d) 200m

22) The bearing of the runway at threshold is 290°, the runway number is [ ]

a) N 70° W b) 290° c) 29° d) W 20

23) The best direction of a runway is along the direction of [ ]

a) longest line on wind rose diagram b) shortest line on the wind rose diagram

c) line clear of wind rose diagram d) none of these

24)) International Civil Aviation Organisation (I.C.A.O.) was set up at Montreal (Canada), in[ ]

a) 1929 b) 1939 c) 1947 d) 1950

25) The air is blowing at a speed of 75 knots in the direction of the aircraft flying at a ground speed of 775 knots. The air speed of the aircraft, is [ ]

a) 775 knots b) 75 knots c) 850 knots d) 675 knots

26) The maximum length and pavement strength of the runway is that of [ ]

a) 1 b) 2 c) 3 d) 7

27) According to the International Civil Aviation Organisation (I.C.A.O.), the runway lengths of aerodromes have been coded by [ ]

a) Seven English alphabets b) Last Seven English alphabet

c) First Seven English alphabets d) First seven natural numbers

28) The strength of winds is measured with the help of [ ]

a) Benfort scale b) Wind indicator c) Barometers d) None of these.

29) The landing and takeoff of the air craft is made against the direction of wind. In no case the centre line of the runway should make an angle with the wind direction exceeding [ ]

a) 10° b) 20° c) 30° d) 40°

30) According to I.C.A.O. all markings on the runways are painted white and on taxiways[ ]

a) Black b) red c) yellow d) green

31) If the width of the approach area near the runway end is 150 m, the width of the approach area at a distance of 3 kilometres from runway end will be [ ]

a) 1500 m b)1 200 m c) 1000m d) 800m

32) The reduced levels of the ends *A* and *B* of a runway are 3025 m and 3035 m and that of its mid-point is 3015 m. The reduced level of the horizontal surface, is [ ]

a) 3070 m b) 3060 m c) 3075 m d) 3015

33) The height of the pilot's eye above the runway surface is assumed [ ]

a) 1m b) 3m c) 4m d) 5m

34) For night landing, the thresholds are lighted [ ]

a) green b) yellow c) red d) white

35) For the proposed air port, the survey project provides [ ]

a) master plan b) topograhic plan c) grading plan d) all the above

36) The maximum value of the angle of turning of the nose gear large jet aircrafts, is limited to[ ]

a) 20° b) 30° c) 45° d) 60°

37) Total correction for elevation, temperature and gradient for a runway should not be morethan

a) 15% b) 20% c) 30% d) 35% [ ]

38) Two single runways may be arranged so as to have [ ]

a) *L*-shape b) T- shape c) X shape d) All he above

39) The length of runway is increased per 300 m rise above M.S.L. [ ]

a) 3% b) 4% c) 6% d) 7%

40) If lift off distance of an craft is 2000 m, the clear way at the end of the runway should not be less than

a) 145 m b) 152.5 m c) 162.5 m d) 172.5 m [ ]

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UNIT – IV

RUNWAY AND TAXIWAY DESIGN

1. The length of a runway at sea level, standard atmospheric conditions and zero gradient is 1500 m. The airport site has an elevation of a 900 m and the reference temperature as 20^0C.If the proposed Runway grading permit an effective gradient of 0.20 percent, determine the actual runway length Required at the site.
2. What are the various correction to be applied to standard runway to obtain to actual length of a Runway? Explain.
3. (a) Explain about runway orientation?
   (b) Sketch wind rose diagrams of Type-1 & Type-2 and short notes on it?
4. (a) Short notes on runway lighting system.
   (b) Sketch wind rose diagrams of Type-1 & Type-2 and short notes on it?
5. Write short notes on orientation of runway. Also explain about the correction of runway length?
6. Write a short note on geometric design of taxiway?
7. Briefly explain about standards and specifications of runway and taxiway?
8. Write a short notes on geometric elements of runway. Also explain the runway length corrections?
9. Write a short notes on runway lighting system?
10. (a) Define runway and taxiway?
    (b) What are the uses of wind rose diagram?
    (c) Write any four geometric element of runway?

(d) Draw a typical layout of wind rose diagram?

(e) Write about the correction to be applied in the runway length?

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QUESTION BANK (OBJECTIVE)

Subject with Code : TE-II(13A01703) **Course & Branch**: B.Tech - CE

Year & Sem: IV-B.Tech & I-Sem **Regulation:** R13

UNIT – IV

RUNWAY AND TAXIWAY DESIGN

1) As per ICAO recommendation, minimum width of safety area for instrumental runway should be

a) 78 m b) 150 m c) 300 m d) 450 m [ ]

2) As per ICAO, for A, B, and C type of airports, maximum effective, transverse and longitudinal grades in percentage respectively are [ ]

a) 1.0, 1.5 and 1.5 b) 1.0, 1.5 and 2.0 c) 1.5, 1.5 and 2.0 d) 2.0, 2.0 and 2.0

3) As per ICAO recommendation, the rate of change of longitudinal gradient per 30 m length of vertical curve for A and B type of airp limited to a maximum of [ ]

a) 0.1 % b) 0.2% c) 0.3 % d) 0.4%

4) An airport has 4 gates. If the weighted average gate occupancy time is 30 minutes and gate utilization factor is 0.5, then the capacity will be [ ]

a) 1 aircraft per hour b) 2 aircrafts per hour c) 4 aircrafts per hour d) 16 aircrafts per hour

5) The capacity of parallel runway pattern depends upon [ ]

a) weather conditions and navigational aids available

b) lateral spacing between two runways and weather conditions

c) lateral spacing between two runways and navigational aids available

d) lateral spacing between two runways, weather conditions and navigational aids available

6) The engine failure case for determining the basic runway length may require [ ]

a) only clearway b) only stop way

c) either a clearway or a stopway d)either a clearway or a stopway or both

7) The minimum width of clearway is [ ]

a) 50 m b) 100 m c) 150 m d) 25

8) If the monthly mean of average daily temperature for the hottest month of the year is 25° C and the monthly mean of the maximu temperature of the same month of the year is 46° C, the airport reference temperature is [ ]

a) 32°C b) 35.5°C c) 48°C d) 25°C Ans: c

9) The total length of a runway is 1000 m. The elevation at distance 0,200 m, 400 m, 600 m, 800 m and 1000 m are 100.0 m, 99.2 101.8 m, 101.4 m and 101.0 m respectively. The effective gradient of runway will be [ ]

a) 0.10% b) 0.26% c) 0.43 % d) 0.65%

10) The length of runway under standard conditions is 2000 m. The elevation of airport site is 300 m. Its reference temperature is 33 runway is to be constructed with an effective gradient of 0.25 percent, the corrected runway length will be [ ]

a) 2500 m b) 2600 m c) 2700 m d) 2800 m

11) As per ICAO, the minimum basic runway length for A and E type of airport will be [ ]

a) 1500 m and 600 m b) 2100 m and 750 m c) 1500 m and 750 m d) 2100 m and 600 m

12) Zero fuel weight of an aircraft is: [ ]

a) equal to empty operating weight

b) equal to maximum landing weight

c) less than empty operating weight

d) equal to sum of empty operating weight and the maximum pay load.

13) The cruising speed of the aircraft is 500 kmph. If there is a head wind of 50 kmph, then the air speed and ground speed of the airc respectively will be [ ]

a) 450 kmph and 500 kmph b) 500 kmph and 450 kmph

c) 450 kmph and 450 kmph d) 500 kmph and 500 kmph

14) As per ICAO, for airports serving big aircrafts, the crosswind component should not exceed

a) 15 kmph b) 25 kmph c) 35 kmph d) 45 kmph [ ]

15) Calm period is the percentage of time during which wind intensity is less than [ ]

a) 4.8 kmph b) 6.4 kmph c) 8.0 kmph d) 9.6 kmph

16) For determining the basic runway.length, the landing case requires that aircraft should come to a stop within p % of the landing d value of p is [ ]

a) 40 % b) 50% c) 60% d) 75%

17) According to ICAO, all markings on the runways are [ ]

a) Yellow b) White c) Black d) Red

18) Runway threshold is indicated by a series of parallel lines starting from a distance of [ ]

a) 3 m from runway end b) 6 m from runway end

c) 10 m from runway end d) 15m from runway end

19) The width and interval of transverse centre line bars along the extended centre line of runway, in approach lighting system are [ ]

a) 3 m and 30 m b) 4.2 m and 30 m c) 4.2 m and 50 m d) 3 m and 45 m

20)The size of landing area for multi engined helicopters operating under 1FR conditions is [ ]

a) 22.5 m x 22.5 m b) 30 m x 30 m c) 22.5 m x 30 m d) 60 mx 120 m

21) The centre to centre spacing of heliport lighting along the periphery of landing and takeoff area should be [ ]

a) 2.5 m b) 5.0 m c) 7.5 m d) 10.0 m

22) The slope of the obstruction clearance line from the boundary of the heliport should be [ ]

a) 1:2 b) 1:5 c) 1:8 d) 1:40

23) For supersonic transport aircraft, the minimum turning radius of taxiway is [ ]

a) 60 m b) 120 c) 180 d) 240 m

24) As per UK design criteria, if LCN of aircraft is between 1.25 to 1.5 times the LCN of pavement, then the number of movements allowed are [ ]

a) Zero b) 300 c) 3000 d) Unrestricted

25) Which of the following is an example of failure in flexible pavements ? [ ]

a) Alligator cracking b) Mud pumping c) Warping cracks d) Shrinkage cracks

26) The main disadvantage of angle nose out parking configuration of aircraft is that the [ ]

a) aircraft rear loading door is far away from terminal building.

b) hot blast is directed towards the terminal building

c) overall apron area required is more d) all the above

27) Which of the following is used for servicing and repairs of the aircraft ? [ ]

a) Apron b) Hanger c) Terminal building d) holding apron

28) The slope of the transitional surface for A, B and C type of runway shall be [ ]

a) 1:5 b) 1:7 c) 1:10 d) 1:12

29) The length of clear zone for none instrument runway of a small aircraft is [ ]

a) 150 m b) 300 m c) 600 m d) 750 m

30) In approach areas of runways equipped with instrumental landing facilities any object within 4.5 km distance from runway end s considered as an obstruction if its height is more than [ ]

a) 20 m b) 30 m c) 45 m d) 51 m

31) Maximum gross take-off weight of an aircraft is [ ]

a) equal to the maximum structural landing weight

b) less than the maximum structural landing weight

c) more than the maximum structural landing weight

d) equal to the empty operating weight plus the payload

32) In an airport, if 4 groups of 5 gates each located well separated are considered for traffic and the future to present traffic ratio is 3 total requirement of future gates will be [ ]

a) 32 b) 36 c) 44 d) 68 Ans: b

33) Castor angle is defined as the angle [ ]

a) formed by the longitudinal axis of the aircraft and the direction of movement of the nose gear

b) between the direction of wind and the longitudinal axis of the runway

c) between the true speed of the aircraft and the crosswind component

d) between the horizontal and the fuselage axis

34) The runway length after correcting for elevation and temperature is 2845 m. If the effective gradient on runway is 0.5 percent the runway length will be [ ]

a) 2845 b) 2910 m c) 3030 m d) 3130 m

35) Yellow lighthand signal indicates [ ]

a) stop b) proceed c) proceed cautiously d) none of the above

36) If 'A' is the angle formed by two gauge faces, the crossing number will be [ ]

a) tan A b) cot A c) sec A d) Arad

37) 33) The height of the pilot's eye above the runway surface is assumed [ ]

a) 1m b) 3m c) 4m d) 5m

38) For night landing, the thresholds are lighted [ ]

a) green b) yellow c) red d) white

39) For the proposed air port, the survey project provides [ ]

a) master plan b) topograhic plan c) grading plan d) all the above

40) The maximum value of the angle of turning of the nose gear large jet aircrafts, is limited to [ ]

a) 20° b) 30° c) 45° d) 60°

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QUESTION BANK (DESCRIPTIVE)

Subject with Code : TE –II (13A01703) **Course & Branch**: B.Tech – CE
Year & Sem: IV-B.Tech & I-Sem **Regulation:** R13

UNIT – V

PORTS AND HARBOURS

1. a) Distinguish between natural and artificial harbor . Draw a neat sketch of different types of harbor
   b) define break water and explain its classification.
2. a) what is jetty? Explain open jetties, pilled jetties, cylinder jetties and scrled cylinder jetties.
   b) what are the steps involved in maintenance of lockgates and caissans?
3. a) Explain with a neat sketch the operations of ladder dredger and mention any specila advantages of it .
   b) make a neat sketch dipper dredge and describe its uses. What are the special advantages of these types of dredger?
4. a) Differntiate between port and harbor
   b) What considerations are taken in selecting the location of a harbor?
5. a) How are dock entrance controlled? Explain with neat sketches the used and construction of sliding casinos and ship caisson.
   b) Mention the advantages and disadvantages of floating dry dock.
6. a) Explain the historical background of Bombay ports.
   b) Why it is necessary to provide facilities like apron, transit shed and wave house at ports?
7. a) Bring out the difference between Mediterranean and Cretan harbor.
   b) Explain eighteen century of harbor.
8. a) classify different types of breakwater. Briefly explain the rubble mound breakwater.
   b) Briefly explain about various breakwater failures.

9. a) briefly explain the historical development of water transportation in india.

   b) Write brief note son

      i) Mediterranean harbor ii) Cretan harbor

      iii) Greek harbor iv) roman harbor

10. a) Define dredging. What are the different types of dredging operations?

    b) Define breakwater. What are the different types of breakwater?

    c) Define the following terms

       i) Port ii) harbor iii) docks iv) wharves and jetties

    d) Explain different types of harbors

    e) Define port. What are the requirements of port?

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UNIT – V

PORTS AND HARBOURS

1) When a ship floats at its designed water line, the vertical distance from water line to the bottom of the ship is known as [ ]

a) beam b) depth c) freeboard d) draft

2) The minimum diameter of turning besin, where ships turn by going ahead and without tug assistance should be [ ]

a) L b) 1.5 L c) 2.0 L d) 4.0 L

where L is the length of the largest ship to use the port

3) In basins subjected to strong winds and tide, the length of the berthing area should not be less than

a) the length of design vessel [ ]

b) the length of design vessel + 10% clearance between adjacent vessels

c) the length of design vessel + 20% clearance between adjacent vessels

d) twice the length of design vessel

4) As per Stevenson's empirical formula, the approximate value of the height of the wave in metres is given by [ ]

a) 0.34 VF b) 0.5 VF c) 1.5 VF d) 3.4 VF where F is the fetch in km.

5) As per Berlin's formula, the length of wave in metres is given by [ ]

a) 1.3412 b) 1.5612 c) 1.7412 d) 1.9412

where 't' is the period in seconds for two successive waves to pass the same section.

6) At a given port, the fetch is 400 nautical miles, the maximum height of storm wave will be

a) 2.073 m b) 8.169 m c) 9.144 m d) 6.8 m [ ]

7) In a two lane channel, bottom width of channel is given by [ ]

a) Manoeuvring lane + 2 x Bank clearance lane

b) 2 x Manoeuvring lane + 2 x Bank clearance lane

c) 2 x Manoeuvring lane + 2 x Bank clearance lane + ship clearance lane

d) Manoeuvring lane + 2 x Bank clearance lane + ship clearance lane

8) Minimum width of ship clearance shall be [ ]

a) B or 30 m b) 1.5 B or 50 m c) 1.5 B d) 50 m

where "B" is beam of the design vessel

9) Select the incorrect statement. [ ]

a) The progress of work in low level method of mound construction is very slow.

b) Barge method of mound construction is economical.

c) In low level method of mound construction, the area of working is limited.

d) In staging method of mound cons-truction, the work is not interrupted even during stormy weather.

10) The most popular method of construction of wall breakwaters is [ ]

a) Barge method b) Staging method c) Low level method d) none of the above

11) As compared to wall type breakwater, mound type breakwater [ ]

a) requires skilled labour b) requires low maintenance cost

c) requires less material d) results in less damage due to gradual failure

12) The difference in height between highest high water and lowest low water is called [ ]

a) mean range b) maximum range c) maximum rise d) mean rise

13) If the maximum spring rise is 2 m and height of the waves expected is 4 m , then the breakwater height above the datum will be [ ]

a) 2.5 m b) 4 m c) 5 m d) 7 m

14) If H is the height of the wave expected, then the height of the breakwater is generally taken as

a)1.2 H to 1.25 H above the datum b) 1.2 H to 1.25 H above the low water level [ ]

c) 1.2 H to 1.25 H above the high water level d) 1.2 H to 1.25 H above the mean sea level

15) In multiple point mooring system, vessel is secured to minimum of [ ]

a) two points b) four points c) six points d) eight points

16) Which of the following is a fixed type mooring accessory ? [ ]

a) bollard b) buoys c) cables d) anchors

17) The significant wave height is defined is the average height of [ ]

a) one – third highest waves b) one – fourth highest waves

c) one – fifth highest waves d) one – tenth highest waves

18) If Hs is the significant wave height, then the average wave height and highest wave height respectively are given by [ ]

a) 0.6 Hs and 1.67 Hs b) 0.6 Hs and 1.87 Hs

c) 1.27 Hs and 1.87 Hs d) 1.27 Hs and 1.67 Hs

19) When a wave strikes a vertical breakwater in deep water, it is reflected back and on meeting another advancing wave of similar a merges and rises vertically in a wall of water. This phenomenon is called [ ]

a) Surf b) Clapotis c) Fetch d) Swell

20) Which of the following structures are constructed parallel to shore line to develop a demarcating line between land area and wate [ ]

a) sea walls, bulk heads and groynes b) sea walls, bulk heads and revetments

c) sea walls, revetments and groynes d) bulk heads, revetments and groynes

21) Which of the following type of sea walls results in greatest protection of shore structures?

a) vertical sea wall b) sea wall with batter [ ]

c) stepped sea wall d)sea wall with concave face

22) Which of the following are repair docks ? [ ]

a) marine railways, dry docks, floating docks, wet docks

b) dry docks, wet docks, floating docks, lift docks

c) wet docks, floating docks, lift docks, marine railways

d) wet docks, lift docks, marine railways, dry docks

23) Which of the following structures protects the shore by trapping of littoral drift? [ ]

a) groynes b) sea walls c) revetments d) moles

24) Which of the following conditions of loading imposes the greatest load on the foundation in case of dry docks? [ ]

a) when the dock is empty b) when the dock is empty with the ship of maximum tonnage

c) when the dock is full of water d) when the dock is dry and is under construction

25) For designing the dock, the proportion of ship load assumed to be borne by keel blocks is

a) 5/8 b) 3/8 c) 3/16 d) 5/16 [ ]

26) A ship strikes the berth generally at an angle [ ]

a) 90° with the face of the dock b) 45° with the face of the dock

c) 30° with the face of the dock d) 10° with the face of the dock

27) A ship is berthed in a chamber and lifted by principles of buoyancy Such a chamber is called.

a) Dry dock b) Wet dock c) Floating dock d) Refuge dock [ ]

28) Flow of air from one place to the other is caused due to [ ]

a) the sum of elevation b) pressure head c) velocity head d) all the above

29) According to the recommendations of International Navigational Congress in 1912, the ratio of length to width at the entrance for cargo vessels is [ ]

a) 5.5 and 6.0 to 1 b) 6.2 and 6.8 to 1 c) 7.4 and 7.8 to 1 d) 8.2 and 8.5 to

30) Buoys which support the cables to which vessels are attached are of [ ]

a) drum b) pear shaped c) spherical shape d)) all the above

31) A low wall built out into the sea more or less perpendicular to the coast line, to resist the travel of sand and shingle along a beach, is called [ ]

a) break water b) break wall c) groins d) shore wall

32) At a place the shore line is along North West-South East. The wind is blowing from the north. The littoral drift will be along [ ]

a) south east b) south c) east d) north

33) Depth of borings for soil investigation, is generally kept below low water level [ ]

a) 30 m b) 35m c) 50m d) 45m

34) Which one of the following land marks on the coast line must be depicted on hydrographic maps ?

a) shore line b) light houses c) church spires d) all the above [ ]

35) The smoothened surface of the front face of the guay walls, is known as fending which is made o

a) granite stone b) steel c) timber d) all the above

36) The important component of a sea port is [ ]

a) terminal buildings b) the docks c) the harbor d) all of these

37) The fixed mooring does not require [ ]

a) mooring post b) bollard c) anchors d) capstan.

38) The shape of docks and basins is generally kept [ ]

a) rectangular ways b) diamond shape guays c) inclined gauys d) all the above

39) The width of the entrances of the harbours is restricted to [ ]

a) 100 m b) 150 m c) 125m d) 180m

40) A roadstead : [ ]

a) is a protected area of water where boats can move safely

b) is the end of the road at the harbor

c) may be protected by break water walls d) none of these

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