Combined bank-2023

written- 200

Time- 2 hours

1. If concrete test fails, should Schmidt hammer test be adopted as an alternative test to prove the concrete - 8

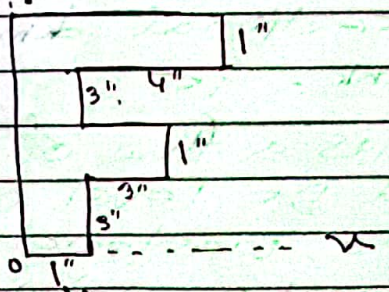
2. Functions of bedding under stormwater drains - 8

3. In soil compaction test results exceeds 100%. Should engineers accept the result - 8

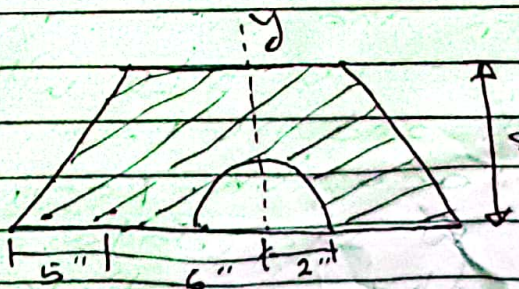
4. What are the advantage of using top-down approach in basement construction - 10

5. What are the advantages of assigning the central pier and the abutment as fixed piers - 8

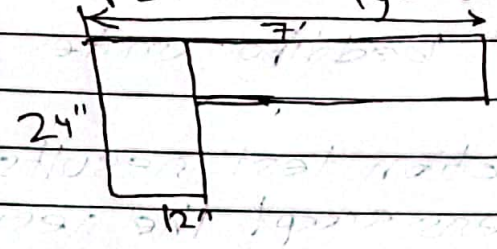
6. Determine the ordinates of centroid of the shaded area about the axes. - 20



7. Determine the moment of inertia about y-axis of the shaded area. - 20.



8. A cantilever roof slab supporting a superimposed DL of 90 psf and a LL of 100 psf. Design the cantilever slab as shown in the figure using ACI design provision and sketch the rebar detailing. $f'_c = 3000$ psi and $f_y = 60000$ psi – 25



9. A small wooden bridge will be constructed over a valley with single wooden plank. The width (b) of the wooden plank will be 8 times the thickness (h) of the plank. There will be only human load and it was estimated the maximum uniform load of 120 lb/ft. If the flexural strength of the wood is limited to 300 psi, calculate the cross-sectional dimension of the wooden plank – 15.

10. A river has a flow of ~~MLD~~ 1000 MLD, BOD_5 of 5 mg/l and DO level of 8 mg/l before recieving the wastewater discharge at a location. For the existing environmental conditions the saturation DO level is 10 mg/l in the river. Waste water discharge of 100 MLD with the BOD_5 of 200 mg/l and DO level of 2 mg/l falls at that location. Assume complete mixing of wastewater and river water calculate the immidiate DO deficit

in mg/l. — 15

11. What is the indication of shear and collaps slump test of wet concrete? — 8

12. A rigid pavement of 1 km, 20ft and 10" thickness. Estimate the sand, cement, aggregate and rebar in ton. if the mix ratio 1:2:4. — 15

13. In a school of 1000 students, 300 students play chess, 500 play Football if 50 students play both chess and football then determine the number of student who play neither — 10

14. ~~Transforming~~ Technology is transforming the banking industry ~~of BD~~ Explain — 10

15. Write an analytical essay on social networks and trust banking — 20

MCQ — 80 marks — 100; Negetive 0.25 per mcq :

1. Bankt English + GK — 32
2. Departmental — 48

1. If w/c = 0.5 and cement = 20 bags then water will be ~~need~~ how much liter?
2. How many point of contraflexure are there for a simply supported beam with UDL.
3. which one is cohesionless soil?
4. In primary sedimentation, the 0.2 mm inorganic solids get seperated if sp. gr is 2.65

5. If the diameter of sewer is 225mm the gradient required, specific gravity for generating self cleansing is velocity 1 in 120

6. for the movement of vehicles at an intersection of two roads, without any interference the type of grade separation generally preffered for is clover leaf

7. The time which results in the least possible construction cost of an activity is known as optimum time

8. If reduced bearing of a line is N 87°W whole circle bearing will be ____

9. Wrought iron contains carbon upto 0.25%

10. The maximum bending moment due to a moving load on a simply supported beam occurs under the load.

11. which one is not an assumption of Bernoulli's equation)
a. Flow is steady b. Flow is ideal c. Flow is irrotational
d. Flow is compressible.

12. Minimum water content in a soil at which the soil just begins to crumble when rolled into threads of 3mm in diameter is known as Plastic limit

13. BOD of safe drinking water should be Nil

14. The wt of the rails depends upon (gauge of the tracks, speed of trains, spacing of sleepers)

15. Critical path lies along the activities having total float zero

16. A badly mixed cement concrete results in honey combing

17. The length of a column, having a uniform circular cross-section of 7.5 cm dia and whose ends are hinged, is 5m. If the value of E for the material is 100 tonnes/cm^2 the permissible crippling load will be 12.88 tonnes.

$$P = \frac{\pi^2 E I}{L_e^2} \quad \Big| \quad I = \frac{\pi d^4}{64} \quad L_e = I$$

18. After prestressing process is completed, a loss of stress is due to (creep of steel, creep of concrete, shrinkage of concrete)

19. The most economical section of circular channel for maximum discharge is obtained when (where d is the dia of circular section) (depth of water 0.95d, wetted perimeter 2.6d, hydraulic mean depth 0.29d)

20. For a curve of radius 100m and normal chord 10m, the Rankine's deflection angle is $2^\circ 51'.53$ $\frac{c}{2R}$ Rad $= \left(\frac{c}{2R} \times \frac{180}{\pi}\right)^\circ$

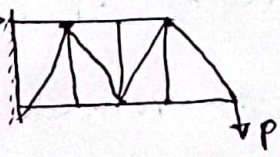
21. The intermolecular attraction of a soil, the cohesion (is more in well compacted clays).

22. Responsible for hardness ___

23. A 728 gm soil sample has a bulk volume of 500 cm^3, moisture content of 13% and specific gravity of 2.7, Find the porosity.

23. The ratio of volume of void to volume of solid is known as ___

24. ?



25. $\frac{PL}{AE}$

26. Raising of outer edge of a road with respect to inner edge is known as (super elevation, cant, banking)

27. closed contours of decreasing value towards their centre represent (a depression)

28. Magnetic bearing of a survey line at any place varies differently in different months of the year.

29. critical depth h for a channel is, $h = \frac{v^2}{2g}$

30. Efflorescence in cement is caused due to the excess of alkalies

31. The maximum size of clay — 0.002mm
silt — 0.06mm

32. Slenderness ratio $= \frac{l}{r}$ $r = \sqrt{I/A}$

33. OCR is greater than 1

34. As the % of steel increases (depth of NA increases).