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SUPER

SSC JE 2020-21 Tier-1 CIVIL ENGINEERING

23rd March

Shift-1

**Memory Based
Questions with Solutions**



10+ Gradians Under AIR 10



Sahi Prep Hai Toh Life Set Hai

SSC JE 2020-21 Civil Subject Weightage Analysis

| SSC JE 2020-21 Shift-1 Subject Analysis | | |
|--|--------------------|------------------|
| Subject | Difficulty Level | No. of Questions |
| Building Materials & Concrete Technology | Easy-Moderate | 12-13 |
| Estimation, Costing and Valuation | Moderate | 6-7 |
| Surveying | Moderate | 9-10 |
| Soil Mechanics | Easy | 11-12 |
| Fluid Mechanics & Hydraulics | Easy | 7-8 |
| Irrigation Engineering | Moderate | 7-8 |
| Transportation Engineering | Easy-Moderate | 3-4 |
| Environmental Engineering | Moderate-Difficult | 12-13 |
| Theory of Structures (SOM+SA) | Moderate | 5-6 |
| RCC Design | Moderate | 10 |
| Steel Design | Moderate-Difficult | 9 |
| Reasoning | Moderate | 50 |
| General Awareness | Moderate | 50 |
| OVERALL | Moderate | 200 Qs |

CIVIL ENGINEERING

Questions Shift-I (Memory Based)

1. What is the unit of dynamic viscosity

Sol. Pascal-seconds.

2. What is the Unit of Kinematic viscosity

Sol. m^2/s

3. Calculate the stopping sight distance for a speed of 80 km/hr considering other conditions as standard values.

Sol. As per Table 11 of IRC 73:1980, the stopping sight distance for a speed of 80 kmph is 120m.

4. What is the definition of activity in CPM?

Sol. An activity is the actual performance of the task and requires time and resources for its completion. It is the work required to complete a specific task.

5. What is the Minimum Grade of RCC and PCC for a construction in the sea coast area ?

Sol. Construction in the seacoast area comes under a very severe exposure category(Table 3, IS 456:2000) and the grades of concrete recommended for Plain Concrete is M20 and for Reinforced Concrete is M25 (Table 5, IS456:2000).

6. What is the formula for calculating the Pigment volume concentration ?

Sol.

$$P.V.C. = \frac{\text{Volume of pigment in paint}}{\text{Total volume of nonvolatile constituents of the paint}}$$

7. What is the function of fly - ash in concrete ?

Sol. Fly ash reduces the heat of hydration in concrete. A substitution of 30 per cent fly ash may result in a reduction of 50-60% heat of hydration.

8. What is the definition of salvage value ?

Sol. Salvage value is the book value of an asset after all depreciation has been fully expensed.

9. Calculate the available moisture in field for field capacity = 47%, moisture content = 27%, wilting point = 14%

Sol. Available moisture = FC - PWP = 47 - 14 = 33%

10. What is the Non-Return valve used in the pipe?

Sol. Check Valve.

11. On which date IRC was set up.

Sol. IRC was founded in 1934 as per the recommendations of the Jayakar committee.

12. Definition of kor watering.

Sol. After sowing, when crops have grown a few centimetres this watering is given. It is the first watering after sowing of the crop.

13. What are the principles of surveying ?

Sol. The two principles of surveying are:

- Working from whole to part: To avoid accumulation of errors.
- Locating new stations from at least two existing stations.

14. Calculate the amount of cement required in cumec for 100 sqm DPC of depth 2.5 cm, Grade 1:2:4.

Sol. Total volume of DPC = $100\text{m}^2 \times \frac{2.5}{100}\text{m}$
= 2.5 m^3 .

Let the volume of cement used be $x\text{ m}^3$.

For 1 : 2 : 4 ratio,

Fine aggregate = $2x\text{ m}^3$

Coarse aggregate = $4x\text{ m}^3$

Total volume = $x + 2x + 4x = 2.5\text{ m}^3$

$$\rightarrow x = 2.5/7 = 0.357\text{ m}^3$$

0.25 m^3 is the closest option.

16. Imposed load is taken from which IS Code?

- IS 875 part 1
- IS 875 Part 2
- IS 875 Part 3

Sol. Imposed loads for buildings are provided in Is 875 Part 2.

17. What is the standard deviation for a M25 grade of concrete ?

Sol. As per Table 8, IS 456:2000 the assumed standard deviation for M25 is 4 N/mm^2 .

18. What is the formula of unit weight in submerged condition?

Sol. Unit weight in the submerged condition is the difference between the bulk unit weight in saturated condition and the unit weight of water.

19. What is the in-situ Test suitable for Soft saturated clays?
- Triaxial test
 - Unconfined compression test
 - Direct shear test
 - vane shear test
- Sol. Vane shear test is the only one of these tests that can be performed in-situ.
20. What is the Height of slump cone in the slump test of concrete workability of concrete ?
- Sol. The height of the slump cone is 30 cm.
21. What is the depth of plunger from bottom in Consistency test ?
- Sol. While performing standard consistency test, the depth of the plunger from the bottom is taken to be 5 to 7 mm.
22. Arrange the following in increasing order of their densities
Water, river sand, steel, granite
- Sol. Water (1000 kg/m^3), Sand ($\sim 1700 \text{ kg/m}^3$), Granite ($\sim 2700 \text{ kg/m}^3$), Steel (7800 kg/m^3)
23. Which correction in the chain survey is not negative?
- Sol. Sag correction is never negative.
24. Permissible limits of organics matters in water to mix the concrete.
- 200 mg/l
 - 300mg/l
 - 2000mg/l
 - 3000mg/l
- Sol. As per Table 1 IS456:2000, the organic solids are limited to 200mg/l.
26. What is the Slump value of concrete used for heavily reinforced beams and slabs?
- Sol. As per Section 7.1 IS456:2000, for heavily reinforced concrete beams and slabs, a medium slump value of 50-100mm is provided.
27. U tube Manometer is used to measure.....
- Sol. u-tube manometer used to measure pressure difference
28. Find discharge ratio if slope of a channel is 1/225 and 1/625
- Sol. As per Manning's equation;
- $$Q = \frac{1}{n} A R^{2/3} S^{1/2} \Rightarrow Q \propto S^{1/2}$$
- $$\frac{Q_1}{Q_2} = \left(\frac{s_1}{s_2} \right)^{1/2} = \left(\frac{1/225}{1/625} \right)^{1/2} = 5/3$$

29. In soil dry density 1.5 g/cc, specific gravity = 2.5, water content 10% find out void ratio..

Sol.

$$e_d = \frac{G}{1+e} \gamma_w \Rightarrow 1.5 = \frac{2.5}{1+e} \times 1$$

$$1+e = \frac{2.5}{1.5} \Rightarrow e = \frac{2.5}{1.5} - 1 = 66.67\%$$

30. Which bogue's compound is responsible for early strength in cement reaction.

Sol. C₃S

31. Which Test is used for determining grade of bitumen.

Sol. Penetration test is used for the determination of the grade of bitumen.

33. What is the Rate of filtration and effective dia of slow sand filter?

Sol. Effective size of sand particles in slow sand filter is kept about 0.2 to 0.3 mm and the coefficient of uniformity is kept between 3 and 5.

34. What is the formula of hoop stress for a thin cylinder?

Sol. $\sigma_h = \frac{pd}{2t}$

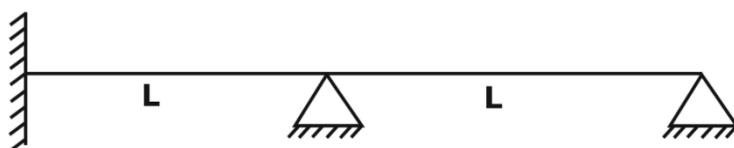
Where,

p = pressure

d = diameter

t = thickness

35. What is kinematic indeterminacy ?



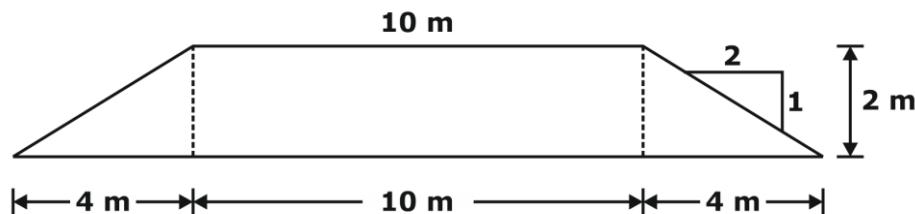
Sol. Assuming the members to be extensible, the kinematic indeterminacy of the structure is 4.

36. What is the effective length of the compression flange of a cantilever beam that has one end fixed and the free end restrained against rotation and movement?

Sol. As per IS 800:2007, the effective length of the compression flange for such a system is 0.7L

37. A formation is 10 m wide with a side slope of 2:1(Horizontal to vertical) and 2 m high. What will be the earthwork required for 1 km length?

Sol.



$$\text{Total Area} = 2 \times \left(\frac{1}{2} \times 4 \times 2 \right) + 10 \times 2 = 28 \text{ m}^2$$

$$\begin{aligned}\text{Earthwork required for 1 km length} \\ = 28 \text{ m}^2 \times 1000 \text{ m} = 28000 \text{ m}^3.\end{aligned}$$

38. The liquid limit and the plastic limit of soil are 45% and 25% respectively. The amount of clay particles is 20%. What is the activity of the soil?

Sol. Plasticity Index, $I_p = WL - PL = 45 - 25 = 20\%$

Amount of clay particles, $C = 20\%$

Activity, $A_c = I_p/C = 1$

GENERAL AWARNESS

1. What is the Birthplace of Subhash Chandra Bose ?

Sol. Cuttack

2. When did World Environment Day start?

Sol. 5 June 1972

3. What is the unit of measurement of earthquakes?

Sol. Richter scale

4. Which among the following is the sacred book of the Buddhists?

Sol. The Tripitaka (Pali Canon)

5. What is the name of the dam on Narmada river?

Sol. Sardar Sarovar Dam

6. Rickets is associated with.....

Sol. Vitamin D or calcium to the diet generally corrects the bone problems associated with rickets.

7. What is the venue of the 2030 Asian game ?

Sol. Doha, Qatar

8. What is the ranking of India in the happiness index?

Sol. 13th

9. In which year Indira Gandhi Peace Award started?

Sol. The Indira Gandhi Prize for Peace, Disarmament and Development was instituted in the memory of the former prime minister by a trust in her name in 1986



10. What is the SI unit of heat?

Sol. The S.I. the unit of heat is Joule.

11. Who calls joint sitting of Lok Sabha and Rajya Sabha?
- Sol. The joint sitting of the Parliament is called by the President (Article 108) and is presided over by the Speaker or, in their absence, by the Deputy Speaker of the Lok Sabha or in their absence, the Deputy-Chairperson of the Rajya Sabha
12. What does N stand for Sonar ?
- Sol. Sonar uses sound waves to 'see' in the water.
13. Which planet is closest to the Sun?
- Sol. Mercury
14. Who was the governor general of India after the 1774 regulating act?
- Sol. Warren Hastings
15. What is National waterways-1 ?
- Sol. The National Waterway 1 or NW-1 or Ganga-Bhagirathi-Hooghly river system is located in India and runs from Haldia to Prayagraj across the Ganges, Bhagirathi and Hooghly river systems. It is 1,620 km long, making it the longest waterway in India.
16. What are the Recently added total number of sports in khelo india youth game ?
- Sol. There are 20 sports disciplines in Khelo India Youth Games 2020. Cycling and Lawn Bowls are the new additional games of this year's event.

SSC JE 2020-21 Civil Expected Cutoff

| Expected Cutoff (SSC JE Tier-1 Civil Shift-1) | | | | | |
|---|---------|--------|--------|--------|--------|
| Years | General | EWS | OBC | SC | ST |
| 2020 | 121 | 110 | 112 | 98 | 100 |
| 2019 | 123.5 | 112.2 | 115.9 | 101.7 | 102.6 |
| 2018 | 127.4 | 118.99 | 122.91 | 107.61 | 107.01 |
| 2017 | 117 | - | 110.75 | 101.75 | 105 |
| 2016 | 100 | - | 92.5 | 84.5 | 85.5 |
| 2015 | 103.75 | - | 91.25 | 88 | 87.75 |
| 2014 | 93.75 | - | 82 | 75.75 | 70 |
| 2013 | 78 | - | 70.5 | 66.25 | 63.5 |
| 2012 | 62.25 | - | 52.5 | 47.75 | 43.5 |

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|-------|-------------------|------------|-------------|-------|-----------------------|------------|-------------|
| 1 | Kumar chitransh | Mechanical | 82000185767 | 11 | Harshvardhan Madhukar | Mechanical | 93000024513 |
| 2 | Rahul Vishwakarma | Mechanical | 3013401107 | 12 | pankaj kumar pandey | Mechanical | 3206601686 |
| 3 | Teja Sri | Mechanical | 8601201160 | 13 | Maheswar Behera | Mechanical | 4604007751 |
| 4 | Shital | Mechanical | 7205713172 | 14 | Paras Gupta | Mechanical | 6015400275 |
| 5 | Y Sreekanth | Mechanical | 10000571203 | 15 | Hemant Chaturvedi | Mechanical | 2405001436 |
| 6 | Latha B | Mechanical | 9010000312 | 16 | Paras Gupta | Mechanical | 6015400275 |
| 7 | ARUN A | Mechanical | 8206201463 | 17 | Dhanaraja a A E | Mechanical | 81000181083 |
| 8 | PALLI PRABHAKAR | Mechanical | 8007205847 | 18 | Vishal kumar sharma | Mechanical | 3010503480 |
| 9 | Tapas kumar sahoo | Mechanical | 4604000127 | 19 | DHANARAJA A E | Mechanical | 81000181083 |
| 10 | Subash D | Mechanical | 81000210648 | 20 | Prerit Mishra | Mechanical | 3010504243 |

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