JUNIOR ENGINEER CIVIL ENGINEERING EXAMINATION 2024 MEMORY BASED QUESTION (PAPER-I)	
EXAM DATE	07/06/2024
EXAM TIME	9:00 AM – 11:00 AM
SUBJECT	Junior Engineer 2024 Civil Engineering (Paper-I)

SECTION A & B : CIVIL ENGINEERING (NON-TECH)

Q.1. Money supply

Ans. M_1 = CC + DD

$M_2 = M_1$ + Post office savings

M_3 = Broad money

$M_3 = M_1$ + TD

$M_4 = M_3$ + Post office savings

Q.2. Macro economics deals with

Ans. Overall economic system.

e.g.: National income, unemployment, poverty.

it is broad view of economic system.

Q.3. How many FD were recommended by Swarena Singh Committee?

Ans. 10 FD were suggested later on with 86th CAA, 2002, 11th FD was added.

Q.4. Which is called the soul of the constitution?

Ans. Dr. B.R. Ambedkar mention the preamble as the very soul of the constitution.

Q.5. What was the percentage of female population as per Census 2011?

Ans. Total population 1210 Million.

Males : 623.7 Million (51.54%)

Females : 586.46 Million (48.46%)

Q.6. What is the freezing point of pure water?

Ans. 0°C

Adding impurity salts reduces the freezing temperaure.

Q.7. Who has been conferred with Tansen Samman 2022?

Ans. Pt. Ganapati Bhat Hasanagi, Hindustani classical vocalist.

Tansen Samman is celebrated in December in Behat village of Gwalior, M.P.

Pt. Ganapati Bhat belongs to the Kirana Gharana of Gwalior.

Q.8. Who got the Lata Mangeshkar award in 2021?

Ans. Kumar Sanu

Q.9. Freedom of speech is mentioned in which article?
Ans. Article – 19 (1) (a)

Q.10. DPSP are mentioned in Article.
Ans. Article – 36 to Article – 51 in Part IV of the constitution.

Q.11. Leander paes is related to which sport?
Ans. Tennis player.

Q.12. Who is the present CM of Karnataka?
Ans. Siddaramaiah

Q.13. During Indira Gandhi the Swaran Singh Committee was formed to make recommendations about fundamental duties which year?
Ans. 1976

Q.14. Which disease due to deficiency of Vitamin-C?
Ans. Scurvy

Q.15. Western Ghat river
Ans. Krishna – Mahabaleshwar, Maharashtra
Ghataprabha – Tributary of Krishna
Malaprabha
Bhima
Tungabhadra
Cauvery

Q.16. GROW initiative by NITI Aayog deals with?
Ans. Greening India's Wastelands with Agroforestry.

Q.17. What was the growth rate of the Hindu population?
Ans. 16.8%: Hindu
24.6%: Muslim
19.9%: Christian
6.1%: Buddhist
8.4%: Sikh
9.4%: Jain

Q.18. Qualification to become judge of SC.

Ans. He/she shall be a citizen of India. He should have served as judge of a high court for at least 5 years or an advocate of a high court for 10 years.

Q.19. Who is the present chairman of UPSC?
Ans. Dr. Manoj Soni

Q.20. What is Newton's second law of motion?
Ans. Force is equal to the rate of change of momentum. For a constant mass, force equals mass times acceleration.

Q.21. Article 16 delas with :
Ans. Prohibition of discrimination in employment in any government office.

Q.22. What is called the power house of a cell?
Ans. Mitochondria

Q.23. Carbohydrate type in Potato?
Ans. Starch

Q.24. Elements in Group-9 of Periodic table.
Ans. Group-9, d-block: Cobalt (Co), Rhodium (Rh), Indium (In), Meitnerium (Mt)
These metals are rarest of Transition metals.

Q.25. Who became India's number-1 TT player?
Ans. Sreeja Akula India's number -1 TT player.

Q.26. All India Table Tennis, 50th edition.
Ans. Swarna Bharathi Indoor Stadium, Visakhapatnam

Q.27. Height of Mahendragiri?
Ans. The highest peak in eastern Ghats, 1901 meters.

Q.28. Diamond Quadrilateral
Ans. Delhi, Mumbai, Kolkata, Chennai

Q.29. Bulk filament damage is due to
Ans. Heat dissipation.

Q.30. Yellow colour of Taj Mahal due to
Ans. Sulphur Dioxide

Q.31. Muslim League ESTD
Ans. 1906

Q.32. Hindu Population

Ans. 79.9%

Q.33. Heart & Soul of constitution

Ans. Article 32

Q.34. Plaster of Paris Formula

Ans. $CaSO_4 \cdot 2H_2O$

Q.35. Cadmium create impact on which body part

Ans. Kidney

SECTION C : CIVIL ENGINEERING

Q.1. Shrinkage index is defined as the numerical difference between.

Ans. $\boxed{I_s = w_p - w_{sh}}$

w_p = plastic limit

w_{sh} = shrinkage limit

Q.2. If the initial head is 10 cm & final head is 5 cm & distance between them is 20 cm, if velocity is 0.01 cm/s, then what is the coefficient of permeability.

Ans. $\Delta h = 10\text{ cm} - 5\text{ cm} = 5\text{ cm}$

$$i = \frac{\Delta h}{L} = \frac{5\text{ cm}}{20\text{ cm}} = \frac{1}{4}$$

$V = k \times i$

$$0.01\text{ cm/s} = k \times \frac{1}{4}$$

$k = 0.04$ cm/s

Q.3. How can we classify the soil if more than 50% of coarser fraction is passing from 4.75 mm sieve and retained on 75 μ.

Ans. Sand

Q.4. If the soil mass is 500 g and 100 g is retained on 4.75 mm and 250 g retained on 2 mm sieve & 100 g is retained on 75 μ sieve, then effective size of soil is :

Ans. 100 g → 4.75 mm

250 g → 2 mm

100 g → 75 μ

$$\text{Percentage finer than } 75\mu = \frac{50}{500} \times 100 = 10\%$$

Effective size $D_{10} = 75\ \mu$.

Q.5. If water table of the soil reaches upto ground level, then the unit weight considered in calculating bearing capacity of soil.

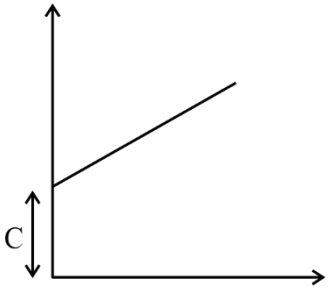
Ans. Submerged unit weight.

Q.6. Inverted sand filters are used to :

Ans. The inverted filter consists of one or more largers of gradel coarse grained free draining material over less pervoius soil. It is used to prevent dams/weirs from failing by water piping through the foundation.

Q.7. While calculating shear strength of soil the intercept on y-axis is known as :

Ans. Cohesion



$\tau = C + \sigma \tan \phi$

Q.8. Soil above the Mohr's failure envelope.

Ans.
- Does not exists.
- Below Mohr's envelope soil is stable on Mohr's envelope it is on verge of failure & above it soil does not exists.

Q.9. Culturable command area (CCA) is defiend as :

Ans. GCA = CCA + Uncultivable area

CCA = GCA – Uncultivable area

Where, GCA = Gross command area

Q.10. **Assertion :** Drip irrigation system is expensive.

Reason : Maintainence required is more, due to salt accumultation & clogging.

Ans. Both are correct & reason is the correct exploration of assertion.

Q.11. If Reynolds number is below 500, then the flow is called

(a) laminar (b) Turbulent

(c) uniform (d) Transitional

Ans. laminar

Q.12. A comopund pipeline consists of two pieces of identical pipes. the equivalent length of same diameter and same friction factor, for the compound pipeling is L_1 when pipes are connected in series, and is L_2 when connected is paralle. What is the ratio of equivalent lengths L_1 to L_2?

(a) 32 : 1 (b) 8 : 1

(c) 2 : 1 (d) $\sqrt{2}$: 1

Ans. **(b)** 8 : 1

Q.13. Hand Signal for ranging "Both arm above" represent.

Ans. Both arm above head and brought down

Q.14. If WCB of line is 0 degree the direction of Quadrantal Bearing is :

Ans. North

Q.15. This figure represent:

Ans. Narrow Bridge Ahead

Q.16. Permissible sound level for silence zone during day and night are :

Ans. In silence zone,
During night = 40 dB
During daytime = 50 dB

Q.17. Octagon shape sign board represent.

Ans. STOP sign

Q.18. Calculate multiplying constant if focal length of objective is 0.3 m and stadia interval is 5 mm.

Ans. $k = \frac{f}{i} = \frac{0.3\ m}{5\ mm}$

$\boxed{k = 60}$

Q.19. Apparatus used to measure the softening point of Bitumen is

Ans. Ring and Ball Apparatus

Q.20. '3R' in Environment Engineering is used for

(a) Sewage treatment (b) Waste treatment

(c) Waste management

Ans. **(c)** Waste management

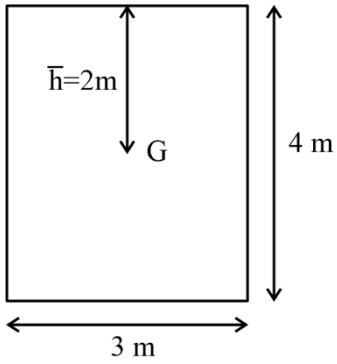
Q.21. Type 1 settling : Particle settle individually.
Type 2 settling : Flocculation cause the particle to increase in mass & settle at faster rate.

Ans. Correctly matched

Q.22. Grade compensation in Broad gauge?

Ans. 0.04%

Q.23. Find out total pressure at the base of the given tank?



Ans. $= \rho g \bar{h} A$

$= 1000 \times 10 \times 2 \times (4 \times 3)$

$P = 240$ kN

Q.24. Horizontal and vertical permeability formula?

Ans. Horzontal permeability $= \dfrac{\sum_{i=1}^{n} H_i}{\sum_{i=1}^{n} \dfrac{H_i}{K_i}}$

Vertical permeability $= \dfrac{\sum_{i=1}^{n} k_i H_i}{\sum_{i=1}^{n} H_i}$

Q.25. When original sanctioned estimated exceeds 5%, then which estimate is used?

Ans. Revised estimate.

Q.26. Formula of Annual Sinking Fund?

Ans. Assnual Sinking Fund $= \dfrac{Si}{(1+i)^n - 1}$

Where;

S = Sinking fund

i = Rate of interest

n = useful time

Q.27. Volume using mid sectional formual.

Ans. Area $= BD_m + SD_m^2$

Where;

$$D_m = \frac{D_1 + D_2}{2}$$

S = Slope

L = Length of road

Volume $= A \times L = \left(BD_m + SD_m^2\right)L$

Q.28. Slenderness ratio

Ans. $\lambda = \frac{L_{eff}}{r_{min}}$

Q.29. For One way slab

Ans. $\boxed{\frac{L_y}{L_x} > 2}$

Q.30. The ratio of the weight of water to the weight of cement in a concrete mix is know as

Ans. water-cement ratio

Q.31. Energy lost due to hydraulic jump:

Ans. $E_L = \frac{(y_2 - y_1)^3}{4y_1y_2}$

$$= \frac{(1.25 - 0.25)^3}{4 \times 1.25 \times 0.25} = 0.8$$

Q.32. Minimum water-cement ratio in RCC & PCC in severe exposure is

Ans. RCC → 0.45

PCC → 0.50

Q.33. In the Newtonian fluid, shear stress (τ) is proportional to

Ans. Rate of shear strain

Q.34. the property of a fluid, by virtue of which it opposes the relative motion between its different layers known as

Ans. Viscosity

Q.35. Now a days which process is used in cement manufacturing.

Ans. Wet process

Q.36. Which of the following method is used to find out the Fineness of cement.

Ans. Air permeability test and sieve analysis.

Q.37. Sedimentary rocks are the result of the

Ans. Accumulation of weathered deposits of igneous rocks

Q.38. Dia of orifice 15 cm & dia of jet is 12.5 cm. Calcualte coefficient of contraction at vena contracts?

Ans. Co-efficient of contraction $Cc= (Ac)^2/(A_2)^2$

$Cc= (12.5)^2/(15)^2$

$Cc= 25/36$

Q.42. Formaula of plaster of paris

Ans. $CaSO_4 \cdot \frac{1}{2}H_2O$

Q.43. Leff of cantilever beam

Ans. $\boxed{L_{eff} = L_0 + \frac{d}{2}}$

Q.44. Effective Length of Isolated T-beam?

Ans. $L_{eff} = \frac{L_0}{\frac{L_0}{b} + 4} + b_w$