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## RAJASTHAN JE
### QUESTIONS PRACTICE BATCH

☞ Starting **20 April 2021**
☞ Duration **100 Hours**
☞ Validity **4 Months**

# Fee @ 399/-

## RAJASTHAN JE
### THEORY CLASSES

☞ Recorded Class
☞ Duration **250 Hours**
☞ Validity **4 Months**

# Fee @ 1498/-

# Q : 1) A flow is said to be sub-sonic flow if the Mach number is

A : More than 1

B : Equal to 0

C : Equal to 1

D : Less than 1

# Q : 2) For pseudoplastic non-Newtonian fluids, the apparent viscosity

A: Increases with increasing deformation rate

B: Decreases with increasing deformation rate

C: Is independent of the deformation rate

D: Decreases with time

# Q : 3) If cohesion > adhesion, then:

## A: Capillary rise occurs

## B: Depression occurs

## C: Remain plane

## D: Either rise or fall

# Q : 4) Hygrometer is used for estimating

## A: Water vapour content of air

## B: Water content of soil

## C: Capillary potential of soil water

## D: Specific gravity of a liquid

**Q : 5) Match List-I (Fluid properties) with List-II (Related terms) and select the correct answer from the options given below the lists:**

| List-I | List-II |
|---|---|
| A. Capillarity | 1. Cavitation |
| B. Vapour pressure | 2. Density of water |
| C. Viscosity | 3. Shear forces |
| D. Specific gravity | 4. Surface tension |

A: A-1, B-4, C-2, D-3

B: A-1, B-4, C-3, D-2

C: A-4, B-1, C-2, D-3

D: A-4, B-1, C-3, D-2

Q : 6) A real fluid in which the shear stress is directly proportional to the rate of shear strain is known as:

A: Newtonian fluid

B: Ideal fluid

C: Ideal plastic

D: None Newtonian fluid

# Q : 7) Which of the following is not a non-dimensional parameter?

## A: Froude number

## B: Darcy-Weisbach friction factor

## C: Chezy's coefficient

## D: Mach number

# Q : 8) Bulk modulus for ideal fluids is

## A: Infinity

## B: Unity

## C: Zero

## D: Any value less than one

Q : 9) A vertical triangular gate has one side in a free surface, with vertex downwards. If the height of the gate is 'h', the depth of centre of pressure is:

A: h/3

B: h/4

C: h/2

D: 2h/3

# Q : 10) The condition of stable equilibrium for a floating body is

**A: The metacentre M coincides with the centre of gravity G**

**B: The metacentre M is above centre of gravity G**

**C: The metacentre M is below centre of gravity G**

**D: The centre of buoyancy B is above centre of gravity G**

Q : 11) The increase in meta centric height

1. Increase stability

2. Decrease stability

3. Increases comfort for passengers

4. Decreases comfort for passengers

He correct answer is

A: 1 and 3                               B: 1 and 4

C: 2 and 3                               D: 2 and 4

**Q : 12) If a mercury-oil differential manometer shows a 20 cm difference of mercury level, the difference in the pressure head is (consider the specific gravity of oil = 0.8)**

A: 2.0 m of oil

B: 2.5 m of oil

C: 3.2 m of oil

D: 4.2 m of oil

Q : 13) A water lake has a maximum depth of 100 m. If the atmospheric pressure is 101 kPa, the absolute pressure at this depth is

A: 1082 kPa

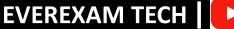B: 881 kPa

C: 900 kPa

D: 778 kPa

# Q : 14) In a standard orifice meter,

**A: The level edge is on the upstream**

**B: The coefficient of discharge does not depend upon the location of taps**

**C: The loss of head is less than that in a venturi meter**

**D: The level angle is usually $30^0$ to $45^0$**

## Q : 15) Venturi meter (V), flow nozzle (N) and orifice meter (O) arranged in increasing order of co-efficient of discharge are

A: V, N, O

B: N,O, V

C: O, N, N

D: O, V, N

Q : 16) Given that, $S_0$ = slope of channel bottom, $S_e$ = slope of the energy, line and F = Froude no., the equation of gradually varied flow, is expressed as

A: $\dfrac{dy}{dx} = \dfrac{S_0 - S_f}{1 + F_2}$

B: $\dfrac{dy}{dx} = \dfrac{S_0 - S_f}{1 + F^2}$

C: $\dfrac{dy}{dx} = \dfrac{S_0 - S_f}{1 + F^2}$

D: $\dfrac{dy}{dx} = \dfrac{S_0 - S_f}{1 + F^2}$

Q : 17) Which of the following Froude number ranges indicates a weak jump?

A: 1.0 to 1.7

B: 1.7 to 2.5

C: 2.5 to 4.5

D: 4.5 to 9.0

# Q : 18) In a hydraulic jump, the energy loss is expressed as

A: $\Delta E = \dfrac{(y_2 - y_1)^3}{4 y_1 y_2}$

B: $\Delta E = \dfrac{(y_2 - y_1)^2}{4 y_1 y_2}$

C: $\Delta E = \dfrac{(y_2 - y_1)^3}{2 y_1 y_2}$

D: $\Delta E = \dfrac{(y_2 - y_1)^2}{2 y_1 y_2}$

# Q : 19) The type of rain-gauge commonly used in India for measuring rainfall is given by:

A: Weighing bucket type rain-gauge

B: Tipping bucket type rain-gauge

C: Floating type rain-gauge

D: Simon's rain-gauge

**Q : 20) Depth-Area-Duration (DAD) curves of precipitation area drawn as**

**A: Minimizing envelopes through the appropriate data points**

**B: Maximizing envelopes through the appropriate data points**

**C: Best fit curves through the appropriate data points**

**D: Best fit mean straight lines through the appropriate data points**

## Q : 21) An isochrones is a line of the basin map

A: Joining rain gauge stations having equal rainfall duration

B: Joining points having equal rainfall depth in a given time interval

C: Joining points having equal time of travel of surface runoff to the catchments outlet

D: Joining points which are at equal distance from the catchments outlet.

# Q : 22) Orographic precipitation occurs due to air masses lifted to higher altitudes by

A: The density differences of air masses

B: A frontal action

C: The presence of mountain barriers

D: Extra tropical cyclones

Q : 23) The graphical representation of average rainfall and rainfall excess (i.e., rainfall minus infiltration) rates over specified areas during successive unit time intervals during a storm is known as-

A: Hydrograph

B: Unit hydrograph

C: Hyetograph

D: None of the above

Q : 24) The unit hydrograph can be used to evaluate the hydrograph of storms of _____.

A: Same duration only

B: Same and longer duration

C: Same and shorter duration

D: Any duration

# Q : 25) A plot of rainfall intensity versus time is called as:

## A: Isohyet

## B: Hyetograph

## C: Hydrograph

## D: Mass curve

Q : 26) As per Indian standards, in predominantly hilly areas with heavy rainfall, there should be 1 rain gauge station per ____ km².

A: 520

B: 330

C: 130

D: 30

# Q : 27) Shielding glass consists high content of

A: Lead oxide

B: manganese dioxide

C: Tin oxide

D: Cobalt oxide

# Q : 28) Bullet proof glass is made of thick glass sheet sandwiched by a layer of-

## A: Steel

## B: Stainless steel

## C: Vinyl plastic

## D: Chromium plate

# Q : 29) How much is the covering capacity of cement paint?

A: About 18 m²/kg per coat

B: About 20 m²/kg per coat

C: About 12 m²/kg per coat

D: About 4 m²/kg per coat

# Q : 30) Linseed oil in paint is used as a:

## A: Thinner

## B: Pigment

## C: Vehicle

## D: Base

# Q : 31) ASCU is:

A: A damp proofing material for concrete

B: A preservative for timber

C: A type of brick bond

D: A type of building finish

# Q : 32) Timber can be made reasonable fire-resistant by-

A: Soaking it in ammonium sulphate

B: Coating it with Tar paint

C: Pumping creosote oil into timber high pressure

D: Seasoning process

# Q : 33) The radial splits which are wider on the outside of the log and narrower towards the pith are known as:-

## A: Heart shakes

## B: Cup shakes

## C: Star shakes

## D: Rind galls

Q : 34) Which of the following is NOT an effect of fly Ash on cement concrete?

A: Reduces permeability of concrete

B: Increases the heat of hydration of concrete

C: Reduces the amount of air entrainment

D: Slightly improves resistance to sulphate attack

**Q : 35) If P, Y and Z are the weights of cement, fine aggregates, and coarse aggregates respectively and W/C is the water cement ratio, the minimum quantity of water to be added to first batch, is obtained by the equation.**

A: $0.1\ P + 0.3\ Y + 0.1\ Z = (W/C) \times P$

B: $0.2\ P + 0.5\ Y + 0.1\ Z = (W/C) \times P$

C: $0.3\ P + 0.1\ Y + 0.01\ Z = (W/C) \times P$

D: $0.5\ P + 0.3\ Y + 0.01\ Z = (W/C) \times P$

# Q : 36) A badly mixed cement concrete results in

## A: Bleeding

## B: Honeycombing

## C: Segregations

## D: None of above

# Q : 37) Identify the correct statement which corresponds to accelerator : retarder.

A: $CaCl_2$ : $CaSO_4$

B: $N_aOH$ : KOH

C: NaCl : $CaCl_2$

D: KOH : $N_aOH$

# Q : 38) The stress strain curve of concrete in compression is obtained by testing the cylindrical specimen under

A: Uniform rate of strain

B: Uniform rate of stress

C: Constant stress condition

D: Constant strain condition

Q : 39) The tensile strength of concrete is approximately what percent of compressive strength of concrete

A: 50%

B: 20%

C: 10%

D: 5%

# Q : 40) The cement and water slurry coming on the top and setting on the surface is called:

A: Crazing

B: Efflorescence

C: Sulphate deterioration

D: Laitance

# Q : 41) The cement concrete from which entrained air and excess water are removed after after placing it in position is called

A: Light weight concrete

B: Prestressed concrete

C: Air entrained concrete

D: Vaccum concrete

**Q : 42) Relative humidity is:**

**A: The relative mass of water vapour per unit volume of space**

**B: The mass of water vapour per unit mass of moist air**

**C: The % ratio of the amount of moisture in a given space to the amount which that volume could contain if it were saturated**

**D: The humidity at which air becomes saturated cooled under constant pressure and with constant water vapour content**

# Q : 43) Which of the following tests compares the dynamic modulus of elasticity of samples of concrete?

## A: Compression test

## B: Ultrasonic pulse velocity test

## C: Silt test

## D: Tension test

## Q : 44) Pozzolana used as an admixture in concrete has the following advantages:

1. It improves workability with lesser amount of water.

2. It increases the heat of hydration and so lets the concrete set quickly

3. It increases the resistance of concrete to attack by salts and sulphates.

4. It leaches out calcium hydroxide.

Select the correct answer using the codes given below:

A: 1, 2 and 3 only          B: 1, 2 and 4 only

C: 1, 3 and 4 only          D: 1, 2, 3 and 4 only

# Q : 45) Choose the correct combination:

| 1. Retarder | P. Fly Ash |
|---|---|
| 2. Accelerator | Q. Superplasticizer |
| 3. Pozzolana | R. Gypsum |
| 4. Workability | S. Calcium chloride |

**A: 1-R, 2-S, 3-P, 4-Q**

**B: 1-S, 2-R, 3-P, 4-Q**

**C: 1-R, 2-P, 3-S, 4-Q**

**D: 1-R, 2-S, 3-Q, 4-P**

# Q : 46) Air entraining agent is commonly mixed in concrete to control _____.

A: Evaporation

B: Expansion

C: Water cement ratio

D: Contraction

Q : 47) The property of aggregate, which can be measured by the Impact value test is known as _____.

A: Flakiness

B: Toughness

C: Hardness

D: Resistance to weathering

## Q : 48) Match List-I (Admixtures) with List-II (Chemicals) and select the correct answer using the options given below:

| List-I | List-II |
|--------|---------|
| P. Water-reducing admixture | 1. Sulphonated melanin formaldehyde |
| Q. Air-entraining agent | 2. Calcium chloride |
| R. Super plasticizer | 3. Lignosulphonate |
| S. Accelerator | 4. Neutralized vinsol resin |

A: 2, 4, 1, 3

B: 1, 3, 4, 2

C: 3, 4, 1, 2

D: 3, 4, 2, 1

# Q : 49) Which of the following is mot a test for measuring workability of concrete?

## A: Slump test

## B: Flow test

## C: Std. consistency test

## D: Kelly ball test

# Q : 50) Which of the following is a field test for measuring the consistency of plastic concrete?

A: Le chatelier's test

B: Compaction factor test

C: Elongation index test

D: Kelly ball test

**Q : 51)** In the context of air entrainment in fresh concrete consider the following statements:

Statement-1: Air entrainment is required in cases when concrete is likely to be subjected to alkali aggregate reaction.

Statement-2: Air entrainment has the effect of increasing the workability of concrete at the same unit water content.

Which of the following is CORRECT?

A: Statement-1 is TRUE and Statement-2 is FALSE
B: Both statements are FALSE
C: Both statements are TRUE

D: Statement-1 is FALSE and STATEMENT-2 is TRUE

# Q : 52) For foundation on clayey soil, the maximum differential settlement is limited

A: 20 mm

B: 30 mm

C: 40 mm

D: 50 mm

# Q : 53) The foundation on weaker soil may be done by

## A: Grillage footings

## B: Column footings

## C: Raft footings

## D: Any of the above

# Q : 54) In Terzaghi's bearing capacity analysis, the soil wedge immediately below the footing remains in state of-

A: Plastic equilibrium

B: Radial shear

C: Elastic equilibrium

D: Linear shear

# Q : 55) Which of the following exhibits maximum deformation?

## A: Local shear failure

## B: General shear failure

## C: Punching shear failure

## D: Composite failure

# Q : 56) According to Coulomb's wedge theory, the active earth pressure slides the wedge:

A: Up and inwards on a slip surface

B: Down and outwards on a slip surface

C: Horizontal upward and parallel to base

D: Horizontal inward and parallel to base

E: None of these options

**Q : 57) The critical height of an unsupported vertical cut in a cohesive soil is given by**

A: $\dfrac{2C}{\gamma} \tan\left(45 + \dfrac{\phi}{2}\right)$

B: $\dfrac{4C}{\gamma} \tan\left(45 + \dfrac{\phi}{2}\right)$

C: $\dfrac{4C}{\gamma} \cot\left(45 + \dfrac{\phi}{2}\right)$

D: $\dfrac{2C}{\gamma} \cot\left(45 + \dfrac{\phi}{2}\right)$

**Q : 58) In a cohesionless soil deposit with a unit weight of 15 kN/m$^2$ and an angle of internal friction of 30$^0$, the active and passive earth pressures (in kN/m$^2$) at a depth of 10 m will be, respectively:**

**A: 150 and 50**

**B: 100 and 200**

**C: 50 and 450**

**D: 200 and 100**

**Q : 59) Which of the following assumptions of the Rankine theory of lateral earth pressure are correct?**

1. Mass is semi-infinite, homogeneous, dry and cohesion-less

2. The ground surface is a plane which may be horizontal or inclined

3. The wall yields about the base and thus satisfies the deformation condition for plastic equilibrium

A: 1 and 2 only

B: 1 and 3 only

C: 1, 2 and 3

D: 2 and 3 only

# Q : 60) A wall constructed for the stability of the excavated portio of the road on the hill side is known as

A: Parapet wall

B: Retaining wall

C: Beast wall

D: Guide wall

Q : 61) If Δp is increment of pressure on a normally consolidated saturated soil mass, as per Terzhghi's theory at the instant of application of pressure increment i.e., when time t = 1, what is the pore pressure developed in the soil mass?

A: Zero

B: Very much less than Δp

C: Equal to Δp

D: Greater than Δp

Q : 62) To have zero active earth pressure intensity at the top of a wall in cohesive soil, the required intensity of uniform surcharge is:

A: 2C cot $\alpha$

B: 2C tan $\alpha$

C: -2C cot $\alpha$

D: -2C tan $\alpha$

# Q : 63) The wall friction of the retaining wall

A: Decrease active earth pressure but increase passive earth pressure

B: Decrease passive earth pressure but increase active earth pressure

C: Decreases both active and passive earth pressure

D: Increases both active and passive earth pressure

**Q : 64) If correct value of cohesion of highly soft clay is to be determines, choose the correct type of test that should be carried out……………**

**A: Field vane shear test**

**B: Triaxial shear test**

**C: Direct shear test**

**D: Laboratory unconfined compression test**

Q : 65) An undrained triaxial compression test is carried out on a saturated clay sample under a cell pressure of 200 kN/m². The sample failed at a deviator stress of 400 kN/m². The cohesion of the given clay sample is:

A: 50 kN/m²

B: 200 kN/m²

C: 300 KN/m²

D: 400 kN/m²

Q : 66) An initial cross-sectional area if a clay sample was 15 cm². The failure strain was 25% in an unconfined compression test. The corrected area of the sample at failure would be

A: 15 cm²

B: 20 cm²

C: 25 cm²

D: 30 cm²

Q : 67) Expansion of soil under shear is called-

A: Liquefaction

B: Volumetric deformation

C: Critical expansion

D: Dilatancy

# Q : 68) Sand drains are used to

## A: Reduce the settlement

## B: Accelerate the consolidation

## C: Increase the permeability

## D: Transfer the load